An Address
ON
BACTERIA IN DISEASES OF THE SKIN.

Delivered at the Annual Meeting of the Dermatological Society of Great Britain and Ireland on May 20th, 1896,

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GENTLEMEN,—My first duty is to thank you for the honour you have done me in making me your President. The gentleman whom I succeed, my distinguished friend Dr. Pye-Smith, has as your first president done much to establish the society on a solid basis. It will be my endeavour to follow in his footsteps. In considering what aspect of our large subject would be most suitable for the few remarks which I propose to offer I have thought it might be well to draw attention to the important topic of causation or etiology. There is no aspect of medicine which has been so successfully studied of late years. Many diseases which formerly we were able to observe only as objects inaccessible to any exact means of inquiry have been found by more refined methods of research and by the crucial test of experiment to be due to perfectly definite agencies. There are now at least two lines of inquiry into etiology which are either wholly new or have undergone a new development within the present generation. They are, first, the influence of micro-organisms in producing disease, and, secondly, the influence of the nervous system on nutrition independently of its accepted functions in relation to motion and sensation. Before applying these immediately to the case of diseases of the skin I will consider for a moment how the results already acquired have modified our general conceptions of pathology. First, it strikes me that certain names and explanations formerly regarded as final, or at least as adequate, must now be regarded as quite inadequate, or at the best as provisional. Consider the time-honoured term "inflammation," which in most of our text-books of medicine used to be regarded as a sufficient explanation of disease in any particular organ. We had only to give such a disease a name ending in "itis," signifying inflammation of the organ, and with that all was said. But with our present view of inflammation as only another name for injury and its consequences the diagnosis inflammation is a diagnosis which asks a question—namely, what was the injury? The diagnosis itself signifies only injury produced by some cause or causes known or unknown; and, considering the number of cases in which the cause of inflammation has been definitely traced, it is not too much to expect that this diagnosis will before long never be regarded as final, but will always be qualified either by the addition of the cause producing the injury or by the frank recognition that the cause is unknown. Another adjective often applied to disease will, I hope, not only be modified but entirely dropped—namely, the unmeaning word "idiopathic." So far as this word has any meaning it only signifies "primary"—that is, beginning in the organ itself and not secondary to disease of any other organ. But the simple word "primary" conveys this meaning much more clearly and the word "idiopathic" seems totally unnecessary.

Now, to apply this problem of causation to diseases of the skin let us consider first the meaning of the words "inflammation of the skin." Here it may fairly be said that the use of this word in dermatology is less open to objection than as applied in other departments of medicine. It has never been the custom to speak of simple dermatitis or inflammation of the skin as it is still the custom to speak of simple tonsillitis, laryngitis, peritonitis, and so forth. The skin being much more exposed to observation than internal parts, it has always been recognised that there are almost as many kinds of inflammation as there are causes of inflammation. Even in inflammations produced by external irritants, such as ammonia, cantharides, and croton oil, we see great differences in the effects of each. Still more is this true of inflammations attributed to internal causes, each traceable cause being found to produce a different effect; and though these effects may be conveniently classed together as inflammation we are not obliged to include them under the one name of dermatitis. But in the case of the larynx, the peritoneum, and other parts, the effects of various mechanical or chemical irritants, as well as of other and more obscure causes, are all described as laryngitis, peritonitis, and so forth. Some day, I have no doubt, these affections will all be discriminated according to their different causes, just as is the case with inflammations of the skin. At present the pathology of this organ is decidedly in advance of that of many other parts in regard to the subject of inflammation.

The etiology of diseases of the skin is so vast a subject that I can only now touch upon one branch of it—namely, the effect of micro-organisms. The opinion which is gradually gaining ground that many affections of the skin are due to bacteria has much *a priori* probability. As a surface exposed to the air the skin is constantly liable to the inroads of microbes of various kinds; moreover, in certain parts of it, even when quite healthy, bacteria are extremely numerous and may grow as simple saprophytes without producing any morbid condition. No other part of the body, with the exception, perhaps, of the mouth and the lower portions of the intestinal canal, harbours so many. We see, then, that the problem which arises when bacteria are found in morbid conditions of the skin is whether they are more or less harmless saprophytes or whether they are the cause of the morbid condition.

CONNEXION OF MICROCOCCI WITH SUPPURATION.

Since attention has been directed to this subject bacteria have been shown to occur in many cutaneous diseases, and among those most frequently met with are micrococci. Certain species of these, especially staphylococcus pyogenes aureus, staphylococcus albus, and the rarer species staphylococcus citreus, occur in large numbers in the common suppurative affections of the skin. By suppurative affections I mean impetigo, originally called impetigo contagiosa, ecthyma (if this be really distinct), pustular acne, folliculitis, sycosis, boils, carbuncles, whitlow, and so on. The same species are found in the secondary suppurations which complicate affections not originally suppurative, such as pustular or impetiginous eczema, pustular scabies, pustular phthiriasis, and also in neglected or festering wounds and scratches. The same organisms, again, have been found in the inflammations of lymphatic glands which accompany or follow many of these diseases, so that a secondary lymphadenitis may be regarded almost as a proof of the bacterial nature of the original cutaneous lesion. That these organisms are definitely the cause of suppuration is now established beyond a doubt. Numerous experiments on the human subject, dating from the personal experiences of Garré, the cultivations and inoculations of Bockhart, Unna, and many others, have shown this to be true not only of suppuration generally but especially of suppuration in the skin. In saying this I do not exclude the influence of other factors in favouring the growth of these organisms. Such factors are the composition of the blood, its containing sugar or products of imperfect digestion, general cachexia, weakening the power of resistance in the tissues, special susceptibility, as in the skin of children, and so forth; but these agencies do not produce cutaneous suppuration apart from the presence of organisms, the only other cause, so far as we know, being the direct action of certain powerful irritants. Another important piece of evidence is the frequent connexion of these suppurative diseases with suppuration of other organs. Some years ago (in the St. Thomas's Hospital Reports for 1883) I collected a number of cases of impetigo contagiosa and showed the frequent connexion of these cases with such inflammations as conjunctivitis, otorrhœa, purulent rhinitis, ulcerative stomatitis, and even purulent vaginitis, as well as with suppurating wounds or scratches. In some cases the cutaneous suppuration was derived from the other affections, whilst in other cases it gave rise to them. This reciprocal relation to other forms of suppuration must have often been observed, but is not always recognised.

I should like to take this opportunity of urging on members of this society that the time is come when this whole class of primary or secondary suppurations of the skin ought to receive a distinct name. M. Leloir has proposed the name

of pyodermitis or pyodermie, but I think a better term is that used by Dr. Darier and Dr. Louis Wickham of Paris—namely, staphylococcia purulenta cutanea. By this we mark them off from the other staphylococcal inflammations just referred to, and also from the deep or internal staphylococcia, of which the most conspicuous kinds are osteomyelitis, some cases of infective endocarditis, and probably some pleurisies. The objection may be made that this name excludes the influence of streptococci, but streptococci are decidedly rare in cutaneous suppurations, having been observed only in a few cases of impetigo (not to speak of the streptococcus of erysipelas). The general property of streptococci also is to cause diffuse spreading inflammations, while these suppurations of the skin are remarkably localised, like staphylococcal lesions generally. If we regard it as proved that staphylococci are the immediate cause of these suppurations the question is not, however, completely settled. We have to deal with the remarkable fact that these organisms are present in or on the skin of many healthy people, living a purely saprophytic life without producing any pathogenic effect. They may be seen or raised by cultivation from such places as the dirt under the nails, the moist parts between the toes, dandriff or scurf on the scalp, and numerous other parts. In cultivations from these regions, as also from many skin lesions which are not suppurative, whatever other organisms may come up staphylococci are extremely likely to be among them. Even now, perhaps, dermatologists do not quite realise the ubiquity of saprophytic micrococci. In a blister produced by sunburn on the arm, and only of a few hours' duration, I have found commencing colonies of cocci. There can, I think, be no doubt that in most cases the cocci which produce suppuration are present in or on the skin beforehand and do not require to be introduced from without. In certain cases, however, the organisms may come from without, since it has been shown that staphylococci are occasionally present in dwellings, and still more frequently on clothes, though they do not appear to have, on the whole, an important ectogenic existence. Infection with pyogenic cocci from external objects is probably a real cause of suppuration, but it is much less important than was at one time supposed. Personal infection is now recognised by surgeons as a far more serious danger. Every person who has pyogenic organisms on his skin or external orifices is a possible source of danger to others and may give rise to suppurative processes in them, even though he himself may be quite free from inflammation. There is only one other possible source for the staphylococci of the skin. It has been suggested by M. Leloir that organisms contained in the blood may be excreted by the sebaceous and sudoriparous glands and thus produce local suppuration. Dr. Walsh has drawn attention to the excretion of toxic bacterial products.[1] These explanations are quite possible, but cannot be said to be actually proved. I will not, therefore, discuss them further now.

With regard to the bacteria of the skin it is important to remember that they are by no means equally or uniformly distributed over the surface. There are certain regions where they are very abundant, forming saprophytic colonies. In other parts their presence may be only detected by the test of cultivation. One of the chief bacterial colonies is the hairy scalp, especially if scurf be allowed to accumulate there. Great numbers of micrococci and occasionally bacilli may be detected on staining the epidermic scales beside the yeast-fungus, saccharomyces capillitii (which, notwithstanding all that has been said, I believe to be a blastomycete). The species of bacteria are, of course, not determinable by observation alone. It is important to note that these organisms do not necessarily produce any inflammation in the part where they grow and multiply. Doubtless desquamation of the scalp, which is the natural or physiological defence of the skin against irritants, makes it possible for the living tissues to escape injury from the cocci which are flourishing in the external layers of epidermis. Other important nurseries for bacteria are the moist parts of the feet and the anal and perineal regions with the adjoining parts. In all these parts saprophytic bacteria are found, which, under certain circumstances, are capable of becoming pathogenic. As regards the scalp, remember that sound and ancient tradition in surgery which has always attached special danger to wounds or operations on the head, a danger expressed in modern language as that of bacterial infection, and one against which the modern surgeon takes many precautions. I wish, however, I could, with all deference, impress upon the antiseptic surgeon that if he or his assistant is affected with dandriff of the scalp there is a very definite risk of scattering pyogenic cocci over his surgical work, and against this risk it is no defence to clean his nails and sterilise his hands. Another evidence of pathogenic properties of organisms derived from the scalp is the occurrence of suppuration on the face, neck, shoulders, and chest, in cases of dry seborrhœa or dandriff, though the scurf itself may be quite free from such a lesion. The suppuration of comedones or common acne on the face I believe to be very frequently due to the descent of pyogenic cocci from the scalp. A special form of acne, independent of comedones, I believe to be also thus produced, and the occurrence of boils on the nape of the neck may be attributed to these cocci being worked by the friction of the clothes into the cutaneous glands. I have drawn attention to this source of purulent infection in my post-graduate lectures for some years, and the connexion of pustular acne with seborrhœa was pointed out by Dr. Edward Blake[2] in a paper published in this journal. These relations, I should say, are quite different from the spread of seborrhœic eczema from the scalp, as described by Unna, though this also is an unquestionable fact. The good effect of antiseptic treatment of the scalp in any pustular affections of the face, neck, or shoulders is a strong corroboration of this view, and I venture to commend this fact to all dermatologists as an important practical hint in the treatment of such affections.

IMPETIGO CONTAGIOSA.

This is a form of suppuration which requires special attention. It is curious how long it was before this comparatively common disease was allowed to have an independent existence. It was first recognised by the late Mr. Startin, and confirmed by Mr. Hutchinson and Dr. Tilbury Fox, that there was a contagious pustular affection to which the name of porrigo or impetigo contagiosa was given. It is fortunate that a distinct name was given, as otherwise the important pathological problem involved might not have been raised. It was, however, confused by the belief that there was another impetigo, the old impetigo sparsa, which was not contagious, and also by the fact that our disease is somewhat local, being commoner in London than in most places, so that it was long discredited by the Vienna school and was even supposed to be a misunderstood form of tinea. It is now, however, acknowledged to be a superficial suppuration caused by the implantation or inoculation of pus. It is, in fact, *inoculated*, not merely *inoculable*, suppuration. This is, I think, what constitutes its real definition, and its name might be inoculated staphylococcia. Now here a curious problem presents itself. Why is suppuration so rarely inoculated? and why is this inoculated suppuration so often, on the one hand, local or endemic, and, on the other hand, epidemic in its distribution? Suppurative diseases are frequent and numerous and the pus cocci are generally distributed, so that if inoculation rarely occurs it must be because some kinds of pus are less inoculable and others more so. Briefly, impetigo is more likely to arise from impetigo itself than from other suppurations, more from superficial suppuration than from deep suppuration, and more when the disease occurs in an epidemic form than from isolated cases. So marked is this difference that it is hardly an exaggeration to say that impetigo is distinctly contagious, while other forms of suppuration—acne, boils, whitlow, and so on—are only locally or partially contagious, so that their spread from one person to another is not an important clinical feature. This being so, one feels that it is hardly an adequate explanation of the fact of contagiosity to say that the pus contains cocci; so does the pus of the non-contagious suppurations; so do masses of dead epidermis where there is no suppuration at all. This is a difficulty which bacteriologists have to face. The difficulty can, I think, be got over by tracing the evolution of contagious impetigo, first in the individual case and then in epidemics. Evolution in the individual from saprophytic cocci is often distinctly traceable. I will quote one instance. A perfectly healthy, robust, well-fed girl, aged fifteen years, has an abrasion in the foot from a nail in the boot; this festers or suppurates through the saprophytic cocci present in that part. A crop of vesicles and pustules extends over

[1] Medical Press and Circular, Oct. 22nd, 1890.

[2] THE LANCET, Dec. 27th, 1890.

the foot, and, in spite of treatment, continues unhealed for more than a month. Then, quite suddenly, nearly two months after the original wound, there appears an eruption of classical impetigo on the face, with pustules, crusts, and enlarged glands, which, had the history not been known, would have been thought to have been produced by infection from another case. Doubtless it was caused by inoculation with the finger nail. Now, had this happened in a crowded dwelling or school, with no precautions against contagion, an epidemic might have resulted. How often must the same thing happen in those epidemics of which we cannot trace the origin. A still more remarkable instance of a transformation of local into infectious suppuration is "football impetigo," which has been seen so often in public schools during the last two or three seasons that it appears almost like a new disease. Boys engaged in a tight "scrum" often get, as is well known, abrasions about the face and ears, and these becoming infected suppuration is set up, which may be transferred to other boys, and thus an actual epidemic is produced. This, again, may spread from one school to another, and even, as I have seen, to football clubs of adults, who must of necessity be robust and healthy young men. Among the best accounts of this disease I would refer to that by Mr. Armstrong of Wellington College, whose specimens were examined bacteriologically by Dr. Galloway. The result was to show that the organisms present, and apparently the only ones, were staphylococcus aureus and albus, which it is possible many of the football players might have been carrying about on their skin long before they were attacked by impetigo. The inference from the various cases I have referred to is that the same cocci show a great variability in virulence or infectiveness. We have first the condition of a simple saprophyte producing no pathogenic effect, next a condition of local inflammation (such as pustules, boils, and festering wounds), next local inoculability (one lesion giving rise to others in the same individual), and finally the condition of extreme virulence (where the contagion passes to other persons and seems to be implanted without any previous lesion of the skin.) With regard to the causes of these variations various hypotheses might be advanced. It has been supposed that the spread of the affection depends on the constitution of persons affected, and could only take place in badly nourished and dirty children, but when actually epidemic we find the disease affects perfectly healthy and well-kept children, and also may spread to adults living in the best sanitary conditions. Or it may be thought that some other organisms beside the pus cocci are the primary cause of infection, the effect of the staphylococci being secondary. It is extremely probable that other organisms often are present, but this supposition would not explain the cases where staphylococci are the only bacteria found. We therefore have to fall back on the hypothesis of increased virulence in the staphylococci themselves. This heightened virulence appears to be caused, first by cultivation of the cocci in a focus of local inflammation, secondly by their growing on a surface where they have abundant supplies of air, and thirdly by transmission from one individual to another. Such a transmission, especially if rapid, appears to heighten the virulence of most contagia in this way. Out of a simple saprophytic growth at length a definite disease results, quite comparable to a specific infection. I may point out that in various other infective diseases not belonging to the skin similar phenomena present themselves: the bacilli of diphtheria, several microbes giving rise to pneumonia, and others which are sometimes pathogenic being often found as saprophytes in the mouths of healthy persons. This is, therefore, an instance in which dermatology supplies us with examples of a pathological law applicable to the diseases of other organs also.

ORIGIN OF ECZEMA.

I have brought forward this explanation of contagious staphylococcia or impetigo as a definite example of evolution through the three stages of saprophytic growth, local virulence, and, finally, active contagiosity. Perhaps a similar explanation may apply to other diseases of the skin and help us to solve a still more important problem—that of the origin of eczema. This disease also has been by many dermatologists—Unna and others—attributed to the agency of bacteria. At first sight the bacterial theory of eczema seems open to many objections. The remarkable bilateral symmetry of this disease; the manner in which it spreads, not always continuously, but springing up in distant parts; the influence of constitutional predisposition and of derangements of internal organs or the nervous system; the great rarity or absence of contagion, with other features of the disease, make it something very different from a parasitic affection, such as ringworm, caused by germs alighting on the body from without. In this sense it is very difficult to believe that eczema is parasitic. You will not expect me to enter fully into this large subject. I only wish to show how far the bacterial theory agrees with some of the clinical facts of eczema, especially when compared with impetigo.

The most striking clinical fact about eczema as compared with other inflammations has always appeared to me to be this—that however produced in the first instance it always tends to persist after the initial cause has ceased to act—that is, to become chronic. A truly acute eczema, acute in the sense of coryza or tonsillitis, erysipelas, pneumonia, and so forth, a disease which rises to its acme and then declines, having a spontaneous limitation, is decidedly rare. When it does occur it is usually the outcome of a chronic eczema. In saying this we exclude the inflammations of the skin produced by thermal, chemical, mechanical, or living irritants; in a word, by traumatism. All these were included in Hebra's definition of eczema, but it is now for the most part agreed that it is better to give the traumatic eruptions another name. For the arguments in favour of this exclusion I need only mention the able exposition of Dr. Pye-Smith in his "Introduction to the Study of Diseases of the Skin." Nevertheless, there are cases in which a primary traumatic lesion results ultimately in true eczema when the subject is what we call predisposed. The prolonged action of irritants may have this result, as with inflammations starting from the friction of a ring or thimble on the finger, and those caused by occupation, as in grocers and washerwomen. Moreover, in persons whom we call predisposed a traumatic inflammation of one part, say of one hand, may give rise to a similar affection of the other corresponding part, that is, of the other hand, as I can say from personal experience. Whatever name may be given to these primary lesions the secondary lesion is indistinguishable from true eczema. In this respect, however, traumatism is only comparable to the other assigned causes of eczema. Most of us believe that a nervous disturbance, more correctly, perhaps, an angio-neurotic disturbance, may be the cause, since we sometimes see a sudden nervous shock followed in a few days or in a few hours by a classical eczema. The same thing happens in those cases which cannot be ignored, where patients ascribe their outbreak to a digestive disturbance.

In all these cases the effect is much more persistent than the cause, and whatever name be given to the primary cause the ultimate effect is eczema. There seems, then, to be some secondary factor coming in and converting all these original disturbances into eczema and making it persistent. What is this secondary factor? It is suggested that it is the action of bacteria, modifying and keeping up the inflammation even if they do not start it. The current explanation of the above facts is "predisposition," or, more precisely, a special "vulnerability" of the skin. It is worth remarking that precisely the same explanation was formerly given for tuberculous and so-called scrofulous diseases, though we now know that while these influences have some weight an essential feature in the tuberculous process is the bacillus of Koch. So, then, in eczema, even if a certain vulnerability of the skin called predisposition may be necessary to its production, this is no argument against the assumption of specific microbial causes. On the whole, the hypothesis that there are such microbes originally present in the skin, and that when their activity is heightened by the original disturbance of nutrition eczema results, seems the most plausible. In children more especially the original lesion may give rise to suppuration, because pyogenic organisms present in the skin find in them favourable conditions of growth. In adults this is less likely to happen, because their skin is less favourable to the growth of those cocci; but whether in children or adults a persistent inflammation may remain attributable to other microbes than those of suppuration, though equally present in the skin beforehand. This inflammation we call eczema. The cases of impetigo and of eczema appear to me, therefore, to run parallel. Both are quite parallel also, I may say, to the cases of traumatic septic diseases generally. In all these the secondary affections called inflammations are mainly produced by bacteria, whatever may have been the cause of the original trauma. There is another point in

which impetigo and eczema are analogous. In the latter, as in the former, we often see local infection especially proceeding from certain centres where bacteria abound. The three great bacterial nurseries of the skin, as I before pointed out, are the scalp, the feet, and the perineal region, with adjacent parts. From these three centres at least eczema may extend and become very general. In the first place we may have the seborrhœic eczema, as first described by Unna, and now an accepted form. Starting from a seborrhœic condition of the scalp, the eczema may invade the neck or face and then spread to other parts of the surface. This, which was the first instance of an eczema shown to have infective properties, might be called, briefly, "descending eczema." We may have, also, an "ascending eczema," spreading from the lower leg, a part where local conditions favour the production of chronic eczema, and close to the nursery of saprophytic bacteria in the foot; this also may in some cases spread upwards to other parts of the surface and even become very general. I might quote cases, but I think it is generally accepted that chronic eczema of the lower leg may give rise to a more general and acute eruption, sometimes nearly universal. More rarely chronic eczema of the anus, scrotum, or perineal region gives rise to an extension over a large part of the skin. This might be called "centrifugal eczema." These three types—"descending," "ascending," and "centrifugal"—may, I think, be clearly recognised. Doubtless there are other similar instances, such as that spreading from the axilla, and all may be merely instances of a more general law. Perhaps, as Mr. Hutchinson had insisted upon, all inflammations of the skin, or, at all events, a great many, are locally infective, but this local infectiveness seems almost to imply the presence of living organisms. In all the above cases we seem to have the same succession of stages which we saw in staphylococcia or impetigo. First, the saprophytic stage of bacteria, which, secondly, by cultivation in a local focus of inflammation acquire pathogenic properties so as to be able to affect portions of skin previously intact. Rarely, however, does the cause of eczema acquire sufficient virulence to produce contagion from one person to another.

This hypothesis seems to me, at all events, to explain the chronic persistence and the local infectiveness of eczema as of impetigo. Whether it also explains the actual beginning or starting point of eczema is a more difficult question. If an organism casually alighting on the skin were capable of setting up eczema we ought to see more often than we do actual contagion of this disease. This occurrence is admitted to be extremely rare. A few instances might be quoted which I will not now discuss. We have had however a remarkable contagious general dermatitis, prevalent some years ago, and also since in several London infirmaries, and described by Dr. Savill. This disease is certainly difficult or impossible to distinguish from general eczema, and it seems probable that it is not a specifically distinct disease, but bears the same relation to eczema as contagious staphylococcia or impetigo does to local suppuration; that is, the microbes of eczema may be stimulated by local inflammation and by transmission from one case to another into such a degree of virulence as to be actively contagious.

Although actual contagion is so rare there must be, however, if eczema be a distinct specific disease, some means of transmission by which the disease is kept alive and passed from one person to another. Without this the hypothesis of a specific cause of the disease is incomplete. It seems possible that there may be transmission, but of a different kind to that which is usually called contagion. If the pathogenic microbe of eczema were originally saprophytic it might be transmitted in that stage of development without producing any symptoms, and the occurrence would thus escape observation. In one form of eczema at least I believe that this mode of transmission does occur, and has indeed been traced by Unna—namely, in the so-called seborrhœic form while in its primary stage of seborrhœa or dandriff. Many facts show that the latter affection is contagious in families and otherwise, and if, as Unna has proved, seborrhœa is one of the starting-points of eczema, then the germ of the disease, though not the disease itself, is transmissible. Thus the continued existence and spread of this form of eczema at least would be explained.

On the whole, the theory that eczema is due to saprophytic organisms, which take advantage of some disturbance of nutrition to cause inflammation, and thus develop infective properties, seems to me best to meet the difficulties of the case. But, to quote a phrase of Harvey, it is not enough to show that an explanation is possible, we must also prove that it is what actually occurs. We ask, then, Have the microbes of eczema been shown to exist? This is a difficult point. There is no difficulty whatever in finding bacteria, there are only too many of them, but the problem is to pick out those that are truly pathogenic. The elaborate researches of Unna on the cryptogamic flora of the skin have shown the existence of a large number of species of microbes. His results are only amenable to this criticism, that the method employed, that of cultivation, is almost too delicate, not distinguishing between bacterial forms actually living on the skin and germs accidentally present as they might be on any surface exposed to the air. The abundance of the particular species found should always be taken into account. Again, experiments on the pathogenic properties of these organisms when inoculated on the skin of the lower animals are less conclusive than in the case of visceral disease on account of the peculiar structure of the human skin.

Apart from the cocci of suppuration certain bacteria believed to be specific have been found; there is Unna's "morococcus," of the existence of which there can be no doubt, even if its etiological importance is not perfectly established. We frequently find a diplococcus which I have seen in sections deep down in the skin. This is probably the same as that described by Unna, and perhaps identical with the diplococcus found by Dr. Risien Russell in the epidemic skin disease. Forms resembling gonococcus and sarcina may also be found. There are doubtless others, for in a disease so multiform as eczema it is very probable that different species may be concerned in different cases. I form no positive conclusions and express no definite opinion as to the precise importance of these organisms; my object is rather to draw attention to the problems which present themselves, among which are the following: Are these organisms saprophytic inhabitants of the skin or are they introduced from without? Are they capable of producing eczema in the same definite sense as the microbes of erysipelas, anthrax, or tinea produce those diseases? Is some preliminary disturbance of nutrition necessary for them to exert a pathogenic effect? In other words, are they primary or only secondary causes of disease? Can cases of eczema be found where the lesions are quite free from bacteria? And may these, therefore, be only accidental concomitants which might be removed without the morbid process coming to an end? Lastly, do the results of treatment support or discredit the bacterial theory? However these questions may be answered there will always remain the question of contributory causes: the condition of the soil—that is, the skin—its age, its inherited properties, its state of nutrition, the influence of the state of the blood, the condition of the walls of the bloodvessels—whether such as to favour exudation or the reverse—the influence of the nervous system in lowering or heightening the resistance of the tissues. All these conditions may have the full effect which has been ascribed to them in the production of eczema, and yet, after all, bacteria may be one of the factors. For the effect produced by all contagia is conditioned by the amount of resistance they meet with. Only a very powerful contagion, such as that of small-pox or measles, is able to make nothing of constitutional resistance and to affect virtually every person not specially protected. Weaker contagia (and the contagium of eczema, if there be one, must be weak) can only affect persons whose powers of resistance are feeble, and hence often require, so to speak, reinforcement by some such causes as I have just hinted at. The bacterial problem, therefore, even if solved, might not produce a total revolution in our way of looking at eczema or in our methods of treating it. But as a dermatological problem it seems to me the most important of the day. Much remains to be done before it can be finally solved. I beg to commend its study, therefore, to members of this society, hoping that the new and exact methods of bacteriology, controlled always by clinical and pathological investigation, may lead us in the end to some solid conclusion.

ROYAL STATISTICAL SOCIETY.—The sixty-second annual general meeting of this society was held on Friday, the 26th ult., at the society's rooms, 9, Adelphi-terrace, Sir Rawson W. Rawson, K.C.M.G., C.B., honorary vice-president, being in the chair, when the officers were elected for the ensuing session.

A Clinical Lecture
ON
MODERN METHODS OF GASTROSTOMY.

Delivered at the General Hospital, Birmingham, on June 5th, 1896,

BY THOMAS F. CHAVASSE, M.D., C.M., F.R.C.S. EDIN.,
SENIOR SURGEON TO THE HOSPITAL.

GENTLEMEN,—I propose to consider with you to-day some of the most recent methods of performing gastrostomy, an operation which must be regarded merely as a palliative measure, yet if undertaken for œsophageal carcinoma before the patient becomes too much enfeebled from starvation it has proved a means of prolonging life and adding considerably to his comfort. It must be borne in mind, however, that many practitioners still entertain a serious dislike to the procedure and prefer to resort to rectal feeding in the hope that death may result from some intercurrent disease, but only those fresh from the schools can be expected to be conversant with the improved conditions which have resulted from the modern methods of operating. Although the idea of gastrostomy originated with Egebert in 1837, yet English-speaking surgeons are indebted to Mr. Howse for having placed the operation on a practical basis, as in 1874 he suggested the plan of performing it in two stages, and delaying the second one, the opening of the stomach, until firm adhesions had taken place between that viscus and the abdominal wall. To carry out the first stage successfully various methods of suturing—the application of padded forceps, the use of hare-lip needles—have each their advocates. You may accept any plan as of practical value which brings and maintains in apposition sufficient areas of the visceral and parietal peritonea to form adhesions firm enough to allow the injection of food into the stomach through a tube; such adhesions once fairly formed will remain, and do not in my experience become absorbed and weakened as time goes on. As an illustration I will briefly narrate a case.

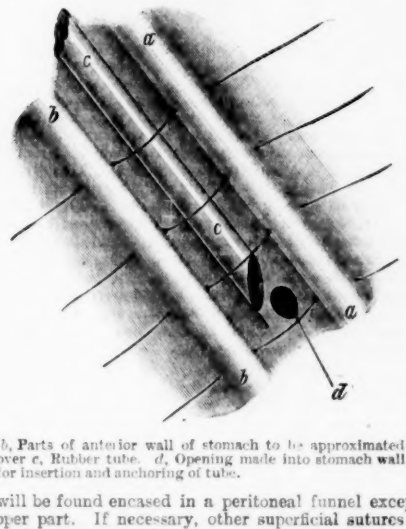
CASE 1.—A man aged fifty-five years was admitted into hospital on Aug. 19th, 1887, with symptoms of malignant stricture of the œsophagus of six months' duration; the obstruction was nine inches from the teeth, but a small bougie could be passed into the stomach. The power of swallowing varied from day to day, but nothing but fluid food reached the stomach. The patient was kept under observation, but as his dysphagia manifestly increased, on Oct. 10th the first stage of gastrostomy was performed, the abdomen being opened by a three-inch vertical incision over the left rectus muscle, its fibres separated, and the stomach secured to the parietes by three running silk sutures.[1] The opening of the stomach itself was performed three days later. Death took place on Feb. 12th, 1888, the immediate cause being broncho-pneumonia. At the post-mortem examination the lower part of the œsophagus was found to be converted into a large ulcerating mass five inches long, involving the whole thickness of the tube, and, posteriorly, perforation into the mediastinum had taken place. The upper limit of the ulcerating mass was opposite the bifurcation of the trachea, which was involved but not absolutely perforated. Secondary growths were found in the posterior mediastinal glands, in the right lobe of the liver, and in both kidneys. Microscopically the neoplasm was a squamous epithelioma. The adhesions between the anterior wall of the stomach and the abdomen round the fistula were very fibrous.

The principal inconvenience experienced by this patient, as well as by others who have lived for some weeks after the operation, was the leaking from the fistula, especially when digestion was in progress; as a result the skin for some distance round the opening was in a condition of chronic eczema very troublesome and distressing to the individual. Many forms of applications, oleaginous, powdery, and watery, were tried and proved of little real value. This leaking of the stomach contents has nearly always to be reckoned with to a greater or lesser degree when the gastric fistula is freely used for feeding purposes, and it is an objection which with the older plans of operation had to be borne in mind when the advisability of the operation had to be pressed upon the patient, his relatives, and friends. Many devices, more or less ingenious, have been suggested to obviate this serious defect, and in recent years several Continental surgeons have exercised their inventive powers and practical skill in endeavouring to overcome the disadvantage. We will consider them in the following order: (1) Hahn's method, 1890;[2] (2) Oscar Witzel's method, 1891;[3] and (3) Albert's method, 1892.[4]

Hahn's method.—The abdomen is opened by a transverse incision below the ribs and, the stomach having been exposed, a second incision is made in the eighth left intercostal space, through which the organ is drawn out and fastened between the cartilages; it is then opened. The idea is that the ribs will act as a stopcock and so prevent leakage. In the only example I have seen of this method this end was not attained during the ten days the patient survived the operation, and it certainly appeared to me to give rise to more pain than the ordinary operation; it is also possible to wound the pleura or the diaphragm, or a necrosis of the cartilages may subsequently supervene.

Witzel's method.[5]—The primary incision commences in the middle line, a finger's breadth below the left costal cartilages, and is carried transversely outwards for three or four inches. The rectus muscle having been laid bare, its fibres are separated by the handle of the scalpel, held apart by retractors, and the peritoneal cavity opened. A portion of the stomach is now drawn outside, packed round with warm sponges, and opened on its anterior surface by a small incision placed near its cardiac end, sufficient to permit the introduction of a fair-sized drainage-tube. The tube should be about five inches long and about one inch of it should be inserted into the cavity of the stomach and anchored there by two or more sutures which penetrate the muscular and peritoneal coats of the organ and the indiarubber tube so as not to open its calibre. Silk sutures are next passed half an inch from the tube through the muscular and peritoneal coats of the stomach, over the tube and through the corresponding coats on the other side of it. From four to six sutures may be so inserted, but all should be passed before any tying is attempted. (Fig. 1.) When this is done the

FIG. 1.



a, *b*, Parts of anterior wall of stomach to be approximated over *c*, Rubber tube. *d*, Opening made into stomach wall for insertion and anchoring of tube.

tube will be found encased in a peritoneal funnel except at its upper part. If necessary, other superficial sutures may be added between the deeper ones. The effect produced is shown in Fig. 2. Four or five silk sutures on either side are next employed to secure the viscus to the cut edges of the abdominal wall, and the wound is lightly packed with

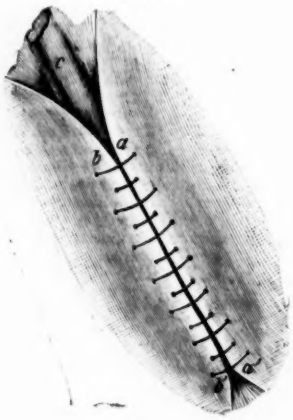
[1] THE LANCET, Feb. 20th, 1886.

[2] Centralblatt für Chirurgie, 1890, vol. xvii., p. 193.
[3] Ibid., 1891, p. 601.
[4] Wiener Klinische Wochenschrift, 1893, vol. vi., p. 231.
[5] Figs. 1 and 2 are taken from the author's paper.

iodoform gauze. If deemed necessary, milk or other nutriment may now be injected through the tube, but it is preferable to wait twenty-four hours, when some adhesions will have formed.

CASE 2.—A man aged forty-six years was admitted to hospital on March 15th, 1894. There was a history of syphilis, and marked symptoms of dysphagia had existed for three months. A large mass of infiltrated gland tissue was evident on the left side of the neck and the body was much emaciated; the obstruction was about eight inches from the teeth. Witzel's operation was performed on March 20th, the tube being anchored to the opening in the stomach by two catgut sutures, and six silk sutures were employed for folding the organ over the tube (the size of the tube was No. 14, Ingram's make); four silk sutures on either side secured the organ to the parietes. Owing to the condition of the patient feeding by the tube was commenced the evening of the operation. On the third day the tube was found loose in the dressings, and some difficulty was experienced in replacing it in the stomach, two of the lower infolding stitches having to be removed for the purpose and then re-inserted. On the fifth day symptoms of pneumonia appeared, and although he was fed and stimulated freely through the tube he sank and died from heart failure on March 28th. The pathologist's report shows that the stricture of the

FIG. 2.



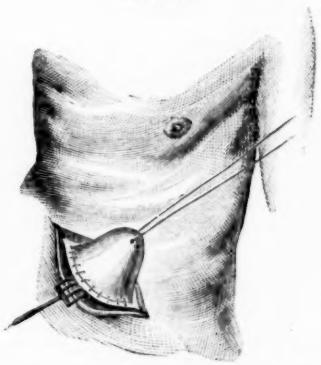
œsophagus commenced at the upper margin of the cricoid cartilage and extended downwards two and a half inches; below this point the gullet was collapsed. The tumour in the neck was also carcinomatous, and between it and the pharynx a small abscess existed; no other secondary growths were found. The heart was small, flabby, and atrophic. The drawback in this case was the escape of the tube from its moorings on the third day, due to the speedy absorption of the catgut, and its re-introduction proved a matter of some little difficulty. The employment of catgut as a suture was evidently a mistake and I resolved to substitute strong horsehair on the next occasion. The specimen, which was exhibited at a meeting of the Midland Medical Society,[6] showed the funnel-shaped opening into the stomach to be well-established and readily permitted withdrawal and introduction of the tube.

CASE 3.—A man aged fifty-nine years was sent into hospital on Dec. 10th, 1895, by Mr. Whitehouse of Solihull owing to difficulty of swallowing, prominent symptoms being first noted three months before accompanied by loss of weight (on admission this was 8 st. 8 lb., normal 11 st. 7 lb.). An obstruction was evident in the œsophagus eleven inches from the teeth. For some days the patient was kept under observation, and it was found that sometimes liquid food passed into the stomach, but that on other occasions everything taken by the mouth was returned. On Dec. 20th gastrostomy according to Witzel's method was performed. The tube was anchored to the stomach aperture by three horsehair sutures and to the edges of the skin at the top of the incision by two silkworm-gut sutures. The infolding sutures were seven in number and the viscus itself was secured to the edges of the parietal incision by four silk sutures on either side. Iodoform gauze was then packed round the tube. The operation was well borne; there was no rise of temperature following it, practically no pain, and all vomiting ceased. Feeding through the tube was commenced next day. The tube remained *in situ* until Jan. 6th, 1896, when it was found loose, so I removed, cleaned, and replaced it in the stomach without any difficulty. When the organ was filled there was no leaking of its contents and nothing was expelled on coughing. On Jan. 25th, the wound having healed round the tube, an abdominal belt with a small turning-down flap in the region of the tube to readily permit feeding was fitted and the patient got up. He was retained in hospital until Feb. 8th in order that the effect of the upright position and of exercise might be observed. As no leaking and no other inconvenience resulted he left the hospital on that date. His weight then was 8 st. 3 lb. In answer to my inquiry Mr. Whitehouse kindly informs me that death took place on May 18th. He goes on to say: "The gastric fistula was certainly a success, the patient usually taking three pints of milk a day, with eggs and whisky beaten up in it. The tube fitted very well all through; there was no leakage or soreness of the surrounding skin. His wife removed the tube daily, and she tells me she never had any difficulty with it. The growth increased considerably before death and involved the trachea." He also tells me that after leaving the hospital the man had a sharp attack of influenza, with congestion of one lung, and that the feeding and stimulation which the fistula permitted were the means of tiding him over that difficulty.

Contrasting this case with No. 1 the advantages it shows are that the patient was fed the day following the operation (and might have been the same day), that he was able to return to his home and his wife at once took up the artificial feeding successfully, that there was no leaking of the contents of the stomach, and no consequent soreness of the skin round the opening, so saving much physical discomfort. This method has been suggested to be very applicable to cases in which a temporary fistula is needed, as it could certainly be closed if required, and in tight fibrous strictures of the gullet it might be utilised in an attempt to dilate the stricture from below upwards.

Albert's method.[7]—An incision, two fingers' breadth below the margin of the left ribs, is carried downwards and outwards over the rectus muscle for three or four inches, and its fibres having been exposed are separated vertically towards the inner edge of the muscle by the handle of the scalpel or some blunt instrument. The peritoneal cavity having been opened, a sufficient portion of the stomach to

FIG. 3.



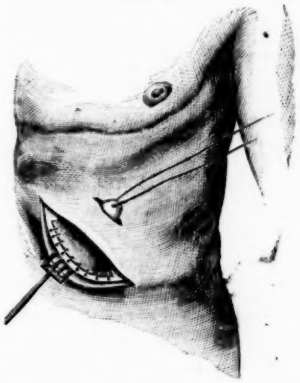
reach the costal cartilages is drawn out of the abdomen. It is then anchored in that position by stitching with continuous or interrupted silk sutures on each side the serous and muscular coats of the organ to the parietal peritoneum and the posterior layer of the rectal sheath (Fig. 3). Through the skin at the level of the costal cartilages, about

[6] THE LANCET, April 2th, 1894.

[7] Paper and diagrams by Dr. Rudolf Frank in the Wiener Klinische Wochenschrift, 1893, No. 13.

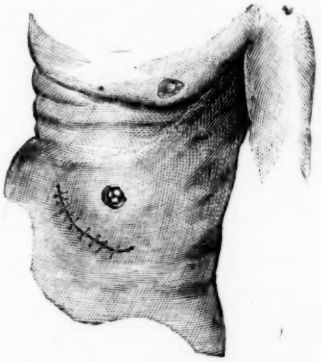
one inch from the outer edge of the wound in the parietes, a small incision, half an inch long, is made, and a bridge undermined between this and the primary incision. Under this subcutaneous bridge the extruded portion of the stomach is drawn upwards (Fig. 4), and a small opening having been

FIG. 4.



made into its cavity by incising its anterior wall the edges of this mouth are secured by four or more fixation sutures to the edges of the small skin wound (Fig. 5). The first incision in the abdominal wall is then completely closed. As a result of this procedure a portion of the stomach becomes subcutaneous, is bent upwards, and forms a sort of artificial

FIG. 5.



œsophagus, the base of which is gripped by the muscular fibres of the rectus which act as a sphincter.

CASE 4.—This patient, a man aged fifty-four years, was admitted to hospital on May 6th, 1896, with a history of dysphagia of twelve months' duration. Since Christmas no solid food had passed into the stomach, as it was rejected as soon as taken. For nine days before admission everything was vomited. The obstruction in the gullet was nine and a half inches from the teeth. His weight was 9 st. 7 lb. (normally 11 st. 3 lb.). On May 8th Albert's operation was performed, a three-inch vertical incision being employed and the fibres of the left rectus muscle separated. The stomach was found to be somewhat small and contracted. Two sling sutures of silk a quarter of an inch apart were inserted into the anterior wall of the organ for the purpose of traction. Four interrupted silk sutures on each side were employed to secure the stomach wall, the parietal peritoneum, and the under surface of the sheath of the rectus. The edges of the peritoneum below the opening were approximated by interrupted sutures and the edges of the skin brought together over that portion of the viscus outside the peritoneal cavity. The undermined bridge of skin between the small opening over the costal cartilages and the upper part of the abdominal incision was one and one-eighth inch wide, and a good deal of traction was kept up by my colleague, Mr. Heaton, who kindly assisted me, in order to keep the organ fixed in position until the six silk sutures employed to connect it to the opening in the skin were inserted. The sling sutures were left *in situ* and the stomach was not incised. The patient was somewhat collapsed for two hours after the completion of the operation, but rallied after nutrient enemata had been administered. For the next two days constant nausea and a marked tendency to vomit existed, although the patient was fed by the rectum. On May 11th the stomach was opened between the sling sutures, which were then removed, and feeding by the catheter commenced.

You now see that when the feeding-tube is introduced about the breadth of the skin bridge a little puff of gas takes place as though a sphincter had been passed through; that about three-quarters of a pint of milk or other fluid food can be injected, and when the tube is withdrawn and the patient coughs violently or turns on to his left side there is no escape of the contents of the stomach. If more than three-quarters of a pint be employed it seems to exceed the limit of the present capacity of the organ and the injected food at once returns. You may have seen two other cases of this method at present in hospital; both have proved satisfactory as regards no stomach leakage. Such a distinguished surgeon as Professor Kocher[8] states that after testing various plans he has come to the conclusion that Albert's method is the simplest and most reliable. Dr. Willie Meyer[9] of New York also believes that this method will become the standard operation for malignant stricture of the œsophagus, especially if the tumour is situated above the cardia. If the plans advocated by Witzel and Albert respectively are compared one operation is as readily performed as the other, but in the latter (Albert's) cases occur in which some difficulty will be encountered in drawing the stomach forward and upwards owing to the cardiac end of the organ becoming more or less fixed by the neoplasm. Certainly more gastric and general disturbance follows its performance than in Witzel's, due to the necessary traction on the stomach wall. The opening into the viscus is also apt to contract somewhat under the bridge of skin. When complete, however, it has the advantage over Witzel's method in that no tube need be worn. I have had no opportunity of testing whether it would be possible to discard the tube in a Witzel when the funnel is fully established, but Professor Keen[10] of Philadelphia states that in a case under his care he tried to remove it temporarily, but had to abandon the practice owing to the difficulty of its re-introduction. It would be more difficult to close the fistula if required in an Albert than a Witzel, but then in most cases the operator desires the opening to be permanent. Both methods give satisfactory results as regards leakage, thereby saving much physical discomfort to the unfortunate patient, and both are very distinct advances on the older methods of operation.

[8] Text-book of Operative Surgery, second edition, translated by Stiles.
[9] Annals of Surgery, vol. xviii., p. 558.
[10] Ibid., vol. xviii., 1893, p. 638.

HIS ROYAL HIGHNESS THE DUKE OF YORK has consented to be a patron of the Royal Hospital, Richmond, Surrey, and has expressed his intention of being present on July 8th on the occasion of the opening of the "Princess May's Ward for Children" by Her Royal Highness the Duchess of York.

NORTH-WEST LONDON CLINICAL SOCIETY.—A clinical meeting of this society was held on June 17th, Dr. Cubitt Lucey being in the chair.—Dr. Harry Campbell showed a case of Peripheral Neuritis in a young man. The symptoms simulated those of tabes dorsalis, save in that the Argyll-Robertson symptom was absent. Dr. Campbell also showed an old man who, when admitted to the hospital, had Redness and Tenderness over the Superficial Temporal Arteries. The case illustrated a very rare condition—viz., acute peri-arteritis.—Dr. Leonard Guthrie showed two cases of Myosis attributable to paralysis of the ocular sympathetic.—Mr. Kenneth Campbell showed a young woman who had a Hard Chancre on an Eyelid. The sore developed one month after the eyelid was accidentally scratched by a young man.—Dr. Sibley described a case of Generalised Vaccinia, and Mr. W. H. Battle showed specimens from cases of Molluscum Fibrosum of the Thigh and Pyosalpynx. Both cases had been successfully dealt with by operation.

A CASE OF DILATATION OF THE STOMACH TREATED BY AN OPERATION BELIEVED TO BE NEW.

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AND
WILLIAM H. BENNETT, F.R.C.S. ENG.,
SURGEON TO ST. GEORGE'S HOSPITAL.

THE time which has elapsed since the date of the operation adopted in the following case is not yet sufficient to justify any positive conclusion as to the permanence of the benefit derived by the patient. We, however, feel justified in recording the case as the results obtained up to the present time (March, 1896) are so good that we believe the treatment to be worthy of consideration and trial at the hands of others in appropriate cases of gastric dilatation.

A man aged thirty-four years, a native of South Australia, was admitted into St. George's Hospital under the care of Dr. Ewart on Nov. 10th, 1895, with the following history, the particulars of which were taken by Mr. E. L. Hunt. He had always been in perfect health until about eight years previously, when he was laid up in Adelaide with typhoid fever, from which he recovered in nine weeks. Almost immediately afterwards he had an attack of rheumatic fever, which incapacitated him for four months or thereabouts. Soon after recovering from the rheumatic fever he began to suffer from "spasms" in the stomach, especially after food. Since that time he had been a constant sufferer from painful dyspepsia, which at times had been so bad as to cause him to take to his bed. For four or five years he had suffered from obstinate constipation and great flatulent distension with severe pain almost continually. In the summer of 1894 these symptoms became so severe that all attempts at following his occupation (that of a carpenter) had to be relinquished. Having been treated for several years in New York and the United States for relief of his symptoms without effect he came to London and was admitted to another hospital as "a case of dilated stomach," which was treated by daily washings, &c. He remained in the hospital for six weeks, and since leaving it he had washed out his stomach assiduously every day with very partial relief. Before leaving that hospital the question of operation was discussed, but nothing further was done. For three or four years there had been progressive loss of flesh. On admission into St. George's Hospital the patient was found to be greatly emaciated, the features were sharp and the cheeks hollow, there was good energy of voice and manner, and the appearance generally was rather that of imperfect nutrition than of disease. The chief symptoms complained of were an extreme constant dragging pain in the right abdominal regions especially when standing; pain at the epigastrium after food, which sometimes extended to the left cardiac area; habitual obstinate constipation; and attacks of anorexia with persistent and almost intolerable flatulence. On examination the organs were found to be normal with the exception of the stomach, which was greatly enlarged (see Fig. 3), and gave a gross splashing sound on percussion which the patient could also himself elicit by shaking his body. For a few days he was kept in bed and treated for the dyspeptic symptoms with complete relief to the dyspepsia and also to the constipation; on being allowed to get up the symptoms, however, returned as before. The patient's misery was so great that he begged urgently for some relief by operation if such were possible, and stated that he was prepared to run any risk as his present condition was unbearable, and that the washings and stomach "toilet" which he had for a time practised were not only almost impracticable for him to carry out but also gave only partial relief. A consultation was therefore held between Dr. Ewart and Mr. Bennett, at which it was decided to carry out a method which it was thought would afford the necessary result. On Nov. 26th (after a consultation with his surgical colleagues) Mr. Bennett performed the following operation. The abdomen having been opened by a median incision about five inches long, commencing above at a point an inch below the ensiform appendix, the stomach was thoroughly examined by the hand introduced through the wound. No adhesions were detected and the pylorus was normal. The viscus was then drawn out of the abdomen and laid upon the parietes, where it presented a large balloon-like bag distended with gas. A fold on the anterior aspect of the stomach was then turned in by the fingers of the assistant (Dr. Nachbar, the house surgeon). The length of this fold, which followed in direction the long axis of the stomach, was about twelve inches, its greatest depth being three inches. The inverted portion was, therefore, about six inches in width at its widest part and twelve inches long (Fig. 1). Whilst this fold was kept

FIG. 1.

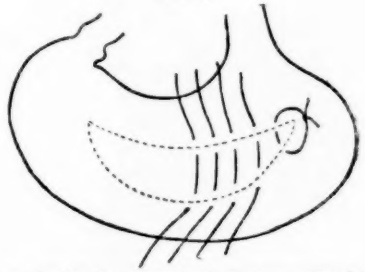


Diagram showing the arrangement of sutures. The dotted lines indicate the extent and shape of the inverted area of the stomach wall.

involuted by the assistant's fingers the peritoneal surfaces on the opposite sides of its base were brought together by numerous sutures made to transfix the peritoneal and muscular coats in the manner indicated in Figs. 1 and 4, the fingers of the assistant being gradually withdrawn from the fold before the tightening up of the final stitches. After the stitches had all been fastened off the size of the stomach was greatly lessened, the shape of the viscus then being that shown in Fig. 2. Mr. Bennett

FIG. 2.

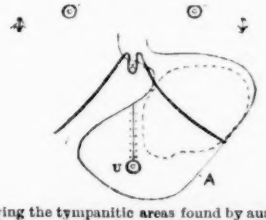
Diagram showing the alteration in the shape of the stomach effected by the operation. A: the sutured edges of the base of the inverted fold. The dotted line B indicates the position of the secondary involution for obviating the dependent tendency of the great end of the stomach.

had intended to make a secondary small involution at the great end of the stomach (Fig. 2, B) to prevent the otherwise inevitable dependent tendency of that part, but as the patient was in a very unsatisfactory condition generally it was thought wiser to be content with what had already been done. The altered viscus was then returned into the abdomen, the wound in the parietes being closed by fish-gut sutures in the usual way.

Progress of the case.—The patient vomited once soon after the operation. As soon as he was fully conscious he was frequently given small quantities of water, as hot as could be tolerated, by the mouth. At 6.30 P.M. (the operation having been completed at 3.15) Mr. Bennett, as the collapse was still marked, himself saw administered an egg beaten up with an ounce of brandy. This having been retained with comfort further nourishment by the mouth in the shape of brandy and meat essence was given throughout the night when the patient, who slept a good deal, was awake, thirst when complained of being assuaged with hot water in small quantities frequently given. On Nov. 27th the patient, having had a very fair night, was a little sick during the morning, but without straining. He took nourishment well—viz., two eggs, extra strong beef-tea, meat essence, and two pints of milk. (This dietary was continued until

Dec. 1st, when chicken and custard were added; milk-pudding was also added on the 8th, greens on the 18th, and he was ordered a mutton chop on Jan. 18th, 1896.) On Nov. 29th the wound was inspected as the dressings were uncomfortable. It was quite healthy in appearance. There had been no more sickness and hardly any pain except a slight dragging pain on deep breathing. The pulse and temperature were normal. On Dec. 1st there had been much improvement. Food was taken without any difficulty, there was no feeling of sickness or pain, the bowels were open, the pulse was 72, full and strong, and the temperature, which was slightly sub-normal before the operation, had risen to about normal with occasionally a few tenths of a degree of pyrexia in the evening. On the 6th all the stitches were removed from the abdominal wound, which had quite healed. There was no discomfort of any kind and the patient felt very well and was placed on a more substantial diet. The bowels were, however, a little distended. On the 8th he got up for two and a half hours. Some pain was complained of in the left thigh along the saphenous vein, which was varicose. There was no rise of temperature. On the 10th there was marked tenderness along the saphenous vein of the left thigh; there was no sign of phlebitis. (Upon inquiry it appears that the patient had an operation performed for varicose veins in New York, the veins "being pinned"; since that operation he has been subject at times to great pain in the veins.) All stomach trouble had disappeared; there was neither pain nor discomfort after food. The pain in the limb, which was kept at rest, was disappearing. On the 18th all pain in the limb had subsided and the patient felt very well. On the 23rd he complained of a slight sensation of dragging at the abdominal scar on standing up; otherwise he was quite well. On the 27th the patient was allowed to remain up permanently; but he still had slight dragging pain. Up till Jan. 14th there was practically nothing further to note. The patient had occasionally complained of some very slight discomfort after meals and also said that he had noticed a suggestion of the old splash; but on examination this could not be elicited either by gentle tapping of the anterior abdominal wall as previously or even by moderate succussion. The size of the stomach was carefully determined by auscultatory percussion on Dec. 16th, and the tympanitic area was found to be considerably reduced (Fig. 3). A further

FIG. 3.



Tracing showing the tympanitic areas found by auscultatory percussion before and after the operation (from a photograph taken by Mr. Powell). A: tracing obtained prior to the operation. The dotted line shows the reduced area of resonance after the operation. U: umbilicus, above which is the line of incision. X: the ensiform appendix. The right and left nipples are also shown, and the arrows indicate the position of the mid-axillary line.

tracing taken a fortnight later gave practically the same result. Since the operation no medicine was administered, with the exception of some acid glycerine of pepsine, an occasional aperient pill, and an occasional carminative dose. For several weeks past his weight had remained stationary; he had regained 2 lb. since the original loss mentioned above. He was still somewhat thin and hollow-cheeked, but was greatly improved in aspect, and his general nutrition was much better than before operation. The patient left the hospital at the end of January, 1896, greatly improved in all respects. The stomach resonance remained the same as in the diagram (Fig. 3); there was no constipation and no dyspeptic symptoms were occurring; the only discomfort complained of was an occasional slight dragging about the abdominal scar, but this was gradually diminishing and was entirely relieved by the use of a light abdominal belt with which the patient had been provided.

Remarks by Dr. EWART.—The uselessness of internal remedies and of the stomach tube having been amply proved before the patient's admission into St. George's Hospital under my care, attention was at once given to the framing of a diagnosis sufficiently accurate, if possible, to be of some use in the selection of the mode of surgical relief. Was this a case of pyloric obstruction, and, if so, was it cancerous in nature or merely fibrous, or was it an instance of simple dilatation, and, if so, had the changes progressed to the stage of atrophy of the mucous membrane and fibrous gastrectasia? These were the chief alternatives which presented themselves for consideration. Although it was difficult to exclude absolutely the possibility of carcinoma, which was suggested by some of the symptoms and by the patient's emaciation, still the positive signs of cancer were absent. There had never been any hæmatemesis, and no tumour could be felt in the epigastrium. A careful review of the symptoms negatived pyloric stricture or even any considerable narrowing of the pyloric orifice. There had been no vomiting either before the systematic use of the stomach tube or since this was discontinued. The recurring gastric attacks had been such as might arise from undue stagnation and accumulation of the contents of a dilated stomach, but the pyloric passage remained clear, and with the help of posture the food had invariably found its way down the intestine. The view that the condition was one of dilatation only, received strong support from the history of its origin. Immediately after a severe attack of typhoid fever the patient suffered from acute rheumatism. Each of these two diseases is an adequate and recognised cause of gastric dilatation; but their sequence in the order stated, in which the recurring inflation incidental to the administration of the bicarbonates and to a fever diet is long kept up in a stomach previously starved and weakened, would of all combinations be the most likely to lead to the result, quite independently of any pyloric affection. Lastly, there was good reason to regard the stomach as free from much atrophy of the mucous membrane. Digestion was at times much disturbed, but between the severe gastric seizures there were intervals of relatively normal function, and the results of test meals administered after preliminary washing out of the stomach were satisfactory. The diagnosis arrived at was, therefore, simple atonic dilatation without pyloric obstruction. Believing that the gastric mucous membrane was in a fairly healthy condition and the pylorus free from disease I should have been disinclined to recommend any procedure (such, for instance, as gastro-jejunostomy) which would interfere with the integrity of the stomach. I had long felt that in cases of this kind the surgical indication was to rectify the faulty mechanical conditions and to relieve in some way the tendency to sacculation. Mr. Bennett had formerly suggested in discussing the matter an operation by which the indication might be fulfilled. The present case struck me as being singularly well adapted for the successful employment of the method in question; I therefore ventured to strongly advocate its performance. The results have so far entirely justified the treatment, as may be seen from the account of the case.

Remarks by Mr. BENNETT.—It cannot be denied that dilatation of the stomach unassociated with pyloric obstruction may be productive of the greatest misery to the patient and may even in some cases lead to a condition bordering upon starvation. In the majority of instances, it is true, life may be continued with varying degrees of pain or discomfort, provided that the stomach be frequently washed out and the necessary restrictions in diet and in the manner of living be rigidly observed. At the same time it must be admitted that the frequent washings and details generally of the stomach "toilet" in these cases are at the best distressful and often revolting to susceptible subjects, by whom the treatment is carried out reluctantly, and as often as not solely because of the fear of the pain and vomiting which may follow upon its omission. In certain classes it is obvious that the treatment referred to is practically impossible, and even with the wealthy and otherwise well circumstanced the treatment is often almost intolerable and has been the determining factor in the serious contemplation of self-destruction. Certain cases have from time to time been recorded in which the separation of adhesions about the stomach after abdominal section has been followed by complete relief of the symptoms complained of in dilatation, and in which a shrinking in the abnormally large viscus has come about. In cases in which no adhesions exist it is clear that nothing short of some actual diminution in the size of the stomach

by operative measures can be relied upon to give practical relief. The obvious proceeding which first suggests itself is the removal of a portion of the whole thickness of the stomach of a sufficient size to produce the desired decrease in capacity, but this operation is unduly severe and could hardly be free from certain risks when the thickness and vascularity of the stomach walls are considered on the one hand, and the very extensive area which would require excision on the other hand in these cases of very large stomachs. After consideration, therefore, I came to the conclusion that the necessary diminution in the stomach capacity could be brought about by doubling in a portion of the walls upon the lines indicated in the description of the case now recorded. This operation is clearly much less severe than any excision of a portion of the stomach could be, and, moreover, although the stomach is itself decreased in size the whole of the mucous membrane is left untouched, which must be distinctly advantageous for purposes of digestion. After a discussion of the subject with my colleague, Dr. Ewart, it was determined to test the treatment in the next case of a sufficiently severe nature which came under observation, as the risk appeared to hardly exceed that of mere abdominal section, which in these times cannot be considered as serious. The only theoretical objection which could be urged against the proceeding appeared to be a possibility that the large infolded flap of mucous membrane might during the contraction of the stomach form an obstructive mass in the pyloric region and so prevent the proper outflow of the contents of the stomach. This objection, however, has no practical value if in the making of the fold care be taken first to avoid encroaching too closely upon the pylorus, and, secondly, to see that the fold follows accurately the long axis of the stomach. As is often the case in an operation performed for the first time on the living subject, there are certain technical defects in the proceeding adopted in the present case which I shall in the future endeavour to avoid, although they in no sense appear to have invalidated the satisfactory result of the treatment up till now in this patient. The defects to which I refer are two in number; the first is the unduly dependent position in which the great end of the stomach remains, which is obviously undesirable, but can easily be rectified in another case either by continuing the main involution along to the extreme cardiac edge of the viscus, or, as I had intended to do in the present case had circumstances allowed, by making a small secondary involution at the situation marked B in Fig. 2. The second defect is one which may or may not be of importance, but I conceive that it may possibly interfere with the permanence of the benefit derived; it can, however, be easily obviated in the future and in no way affects the principle of the operation. It will be seen by reference to A, Fig. 4, that the line of apposition

FIG. 4.

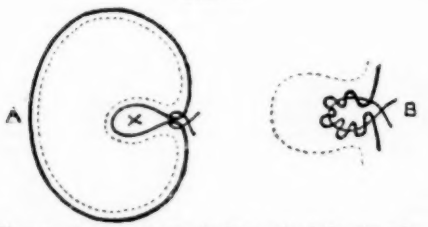


Diagram of section across the long axis of the stomach. A shows approximation of edges of base of involuted fold, x, produced by the operation performed in the case now recorded. B Modification of method of passing sutures referred to in Mr. Bennett's remarks. The dotted line indicates mucous membrane and submucous tissue; the continuous line the peritoneal and muscular coats.

of the opposite peritoneal edges produced by sutures introduced in the manner described is rather narrow; it is therefore conceivable that the line of union as it is so thin may in course of time stretch and so lead to a recurrence of the dilatation. The future history of the case will, of course, settle the point definitely. In the meantime, should another case present itself which is appropriate for operation I shall avoid this possible defect by passing the sutures by threading in and out across the area intended to be turned in, after the manner shown in Fig. 5, no suture being fastened until all have been introduced. The tightening up of stitches each arranged in this purse-string-like fashion will produce an extensive puckering up of the included peritoneal surface in the way indicated in Fig. 4, B, the resulting union being so complicated and extensive that stretching must be practically out of the question. This modification of the operation, although it appears at first sight to add complication to the plan, in reality makes it more easy, since no involution by the fingers of an assistant is necessary, the stitches being merely threaded in and out across the portion of the stomach it is proposed to invert. The extent of the fold included in the stitches can also in this way be much more accurately gauged than when the fold is turned in by the fingers, as its extent must then be in a certain degree doubtful. As will be gathered from the notes of the case now recorded the relief afforded by the operation was remarkable, and, so far as can be judged from the present condition of the patient, there seems to be no reason why it should not be permanent in spite of the apparent possible defects in the technical results of the proceeding to which I have alluded. A noteworthy point in the case is the singular tolerance shown by the stomach for nourishment given by the mouth almost immediately after the operation. A considerable experience of operations upon the stomach confirms me in the conviction, which I

FIG. 5.

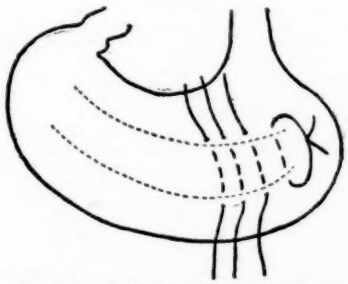


Diagram showing modified plan of introducing sutures for the purpose of obtaining larger area of adhesion of the sides of the infolded flap. The result of this modification is seen in Fig. 4, B.

have frequently expressed, that in cases of operation involving this viscus nourishment by the natural passage cannot be given too soon after the patient has recovered sufficiently from the anæsthetic to be able to swallow. It is further, I think, undeniable that the surest means for counteracting the shock from which these patients succumb when they die soon after operation, is to give at once, in small quantities at a time but freely, water as hot as it can be borne, and then as soon as the stomach has learnt to tolerate water only to begin the administration of liquid or jelly nourishment by the mouth. This plan I have myself always followed, and it is mainly to that practice that I attribute the fact that every patient upon whom I have up to the present time performed operations involving the stomach—e.g., gastro-jejunostomy and suture of perforating gastric ulcer—has recovered, although in two of the cases the patients were at the end of the operation apparently in an utterly hopeless condition. The results of the case described in this communication are in my opinion so good that I shall certainly perform the operation in any other appropriate case which may fall into my hands. The principle of the treatment is, I submit, sound, and the risk entailed in carrying it out cannot with ordinary care be great. It must not be for one moment inferred that the operation is suggested as a routine treatment for gastric dilatation; but for extreme cases in which treatment by the stomach "toilet" is either impracticable, intolerable, or ineffective the radical method adopted in this case may, I believe, be considered a rational proceeding, and may be undertaken by any competent surgeon without subjecting the patient to risks which are out of proportion to the amount of benefit likely to be derived from the operation.

NOTE.—After leaving the hospital the patient resumed his work as a carpenter. Recently (June 17th) he has reported himself complaining of some dyspeptic symptoms. There is a modified stomach splash and the area of resonance is rather larger than that shown in Fig. 3. The sequel of the case will be published later.

OPERATIVE INTERFERENCE IN PERFORATED ULCER OF THE STOMACH.

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IT has been amply shown that life is to be saved by operative interference in cases of perforated gastric ulcer. British surgeons have played a prominent part in this important advance in the practice of surgery. More precise knowledge is still required, however—(1) in the accurate diagnosis of the occurrence of perforation, (2) the most favourable period for surgical interference, and (3) the best method of dealing (*a*) with the perforation when found and (*b*) with the extravasation into, and infection of, the peritoneum. The diagnosis that a gastric ulcer has perforated in the majority of cases is straightforward and free from doubt. There is, however, a minority in which it is not so. Firstly, there is a group in which a patient who is known to have a gastric ulcer is suddenly seized with intense pain over the stomach and symptoms of collapse; the physical signs may corroborate the inference that the ulcer has perforated, and yet on opening the abdomen no such disaster is found to have occurred.

CASE 1. *Supposed perforation of a known gastric ulcer; laparotomy; peritoneum found intact.*—A young woman twenty-seven years of age was seen along with Dr. Francis Boyd on June 10th, 1896, at 10.30 P.M. From the age of eighteen years she had been troubled by her stomach. She suffered from pain, and vomiting occurred about half an hour after meals, the vomited matter occasionally resembling coffee-grounds. Six years ago she was under treatment in the Edinburgh Royal Infirmary for gastric ulcer. Thereafter she remained well for a period of three years; at the end of this time pain and vomiting after food gradually reasserted themselves, without, however, any reappearance of coffee-ground material. About two and a half years ago she had a sudden attack of abdominal pain and collapse similar to the present, during which she was supposed to be in a dangerous condition for twenty-four hours; two or three days after the attack subsided it is stated that she passed an abundant tarry motion. For a day or two before the present attack she had been confined to bed with an aggravation of her usual gastric symptoms—namely, pain in the abdomen, inability to take food, and a feeling of sickness without actual vomiting. At 7 P.M. on the date upon which she was seen by Dr. Boyd and myself she was suddenly seized with very severe pain above the umbilicus with alarming faintness and with cramp and powerlessness in the limbs. She felt sick, but could not vomit. When we saw her at 10.30 P.M. she appeared to be in a very critical condition. She was indifferent to everything but the pain in the abdomen (a little above and to the right of the umbilicus); there was marked tenderness in the epigastric region; the abdominal wall was retracted, did not move with respiration, and the muscles were hard and board-like. The liver dulness was diminished to one inch and a half corresponding, to the fifth and sixth ribs in the right mammary line. The pulse was so rapid and weak that it was impossible to count it. Dr. Boyd and myself agreed that the most probable explanation of her condition was that the ulcer from which she was known to suffer had perforated. Exploration of the abdomen was therefore recommended. Strychnine and ether were administered hypodermically and arrangements were made for her immediate removal to the Infirmary. On admission at 1.30 A.M. on June 11th the pulse was found to have much improved, while the pain and tenderness in the abdomen had subsided to a considerable extent. We agreed that this improvement might be legitimately ascribed to the reaction following the initial collapse caused by the perforation, and we were aware that a similar improvement had been observed in undoubted cases of perforation. The operation was therefore proceeded with at 2 A.M. She required an unusual amount of chloroform before the rigidity of the abdominal muscles appreciably relaxed, and the recti remained rigid until the operation was nearly completed. In the earlier stages of the anæsthesia she retched violently and vomited a quantity of pale green watery fluid. On opening the abdomen above the umbilicus the peritoneum was found normal and empty. The stomach presented at the wound. It was neither dilated nor contracted; on its anterior wall, midway between the curvatures, there was a pale, firm, scarred area over which the serous coat was adherent but had retained its normal lustre. This area evidently corresponded to the ulcer from which she was known to suffer. A finger was pushed through the lesser omentum above the stomach and the lesser sac carefully explored with negative results. The pylorus was normal. The gall-bladder was noticed to be tensely filled with bile. The abdomen was closed and the patient put into bed. For four days she was very ill with abdominal pain and continued vomiting of green, watery fluid. The bowels were moved with enemata and sulphate of magnesia; the motions were normal in colour and never presented any traces of blood. She made an excellent recovery.

It must, therefore, be recognised that a patient who is the subject of gastric ulcer may develop symptoms and signs resembling those which characterise the occurrence of perforation, but which may be due to other causes. Hæmorrhage from the ulcer, in the absence of vomiting (concealed hæmorrhage), is one of these. The attempt should, therefore, be made to exclude the occurrence of hæmorrhage before arriving at a diagnosis of perforation. It is obviously dangerous to wait two or three days until the passage of a tarry stool reveals what has occurred; and it must be admitted that the general signs of internal hæmorrhage may not be sufficiently clear to differentiate between hæmorrhage and perforation. I think it would be good practice to pass a long tube into the stomach and acquire accurate information as to its contents. It is well known that in cases of perforation there is never any blood in the stomach. Supposing that the possibility of hæmorrhage has been excluded, are there any other conditions met with in patients who are known to have an ulcer which may be attended with symptoms resembling those of perforation?[1] The case recorded above is an illustration of such a condition, and it is more than likely that some of the cases which have been reported as having recovered after perforation without operation belong to the same category. It is quite conceivable that the sudden onset of intense stomach pain in a patient with an impressionable nervous system may of itself give rise to symptoms of collapse comparable to those attending perforation and may be attended with marked tenderness and rigidity of the muscles in the epigastric region. How are we to account, however, for the diminution—or it may be total disappearance—of the liver dulness, which has been recognised by competent observers in cases where the abdomen has been opened for supposed perforation, and yet the gastro-intestinal tube has been found to be air-tight? In the case recorded above the diminution in the liver dulness observed might possibly have been due to the marked distension of the hepatic flexure of the colon. So far as I have been able to ascertain this nervous simulation of perforation has been chiefly exhibited by young adult women. The whole question, however, is one of very considerable difficulty and upon which further information is required. In the light of our present knowledge the rule for practice should be thus formulated. Given a patient who is known (or supposed) to have a gastric ulcer, and who is seized with the combination of symptoms and signs which characterise perforation, and, having excluded the possibility of concealed hæmorrhage, it is the duty of the surgeon to explore the abdomen above the umbilicus. I for one would rather operate with a negative result in certain isolated and exceptional cases than run the risk of leaving a suspected perforation to nature. It may be safely asserted that a negative exploration is unattended with any serious additional risk to the patient. I shall conclude the consideration of this group of cases by recording one in which the patient was known to suffer from gastric ulcer, and in which the diagnosis of perforation was straightforward and satisfactory.

CASE 2. *Perforation of a known gastric ulcer; operation within six hours; recovery from the stomach lesion; death from pneumonia on the seventeenth day.*—A single, man forty-five years of age, was admitted to the Edinburgh Royal Infirmary at 11 A.M. on May 1st, 1896, almost moribund and suffering from great pain over the stomach. At the age of

[1] A similar case is recorded by Jowers, THE LANCET, March 2nd, 1895.

twenty-four years he was under treatment in an asylum for melancholia. For the last five years he had suffered with his stomach, pain lasting for several days at a time, and vomiting occurring usually about four hours after food, more often at midnight after supper at 8 P.M. There was occasional blood in the vomited matter and in the stools. The bowels were always constipated. In September, 1895, he was under the care of Professor Fraser[2] in the Royal Infirmary for dilated stomach; he was much emaciated, weighing 6 st. 4 lb.; for days at a time there was constant pain in the umbilical and epigastric regions. He vomited every day, usually about midnight, from one pint to two pints of undigested food; free hydrochloric acid was present, but there were no sarcinæ or yeast cells. The vertical dulness of the liver was five and a half inches. The stomach was washed out daily and he was given cascara and Carlsbad salts; later one-tenth of a grain of bichromate of potash was administered thrice daily. He improved very decidedly and gained 19½ lb. in weight whilst in the hospital. After remaining fairly well for about five months he again began to suffer from pain in the stomach and vomiting. During the four days preceding the present seizure he vomited more frequently and also suffered from diarrhœa. At 8.30 A.M. on the day of his admission he rose and walked about a mile to his brother's house. He was unable to take any breakfast. While sitting at the fire-side he was suddenly seized with severe pain in the abdomen and faintness. On admission to the infirmary he was seen by Dr. R. W. Philip, who found him cold, almost pulseless, and suffering great pain. He was dreadfully emaciated, with a sunken, epitheliomatous aspect. He was quite quiet and sensible. The abdomen was flat, the walls being hard and rigid. The liver dulness was completely replaced by gas resonance. Dr. Philip having sent for the surgeon on duty, I, in the absence of Professor Annandale, saw the patient (along with Dr. Philip) at 1.45 P.M. We agreed that a gastric ulcer had perforated and that although his condition was well-nigh hopeless he should have the benefit of the only chance which was open to him. I operated at 2.15 P.M., about six hours after the supposed perforation. The muscles were rigid even after he was fully under. On separating the recti the peritoneum bulged out, filled with gas. This, along with a moderate amount of turbid yellow, watery fluid, escaped at the wound which was then made. The stomach, very considerably dilated, protruded along with the transverse colon and upper part of the omentum. Replacing the latter viscera, the stomach was further drawn out and examined. After a little time the circular perforation was found about the centre of the anterior aspect of the pylorus, having the diameter of a common pencil. To enable me to return the body of the stomach within the abdomen I had to allow the gas contained in it to escape through a rubber catheter inserted through the perforation. To get better access to the pyloric segment a second incision was made across the right rectus and at right angles to the first as far as the costal margin. The area of the perforation and adjacent anterior wall of the pylorus was then invaginated by a single series of Lembert silk sutures, the series running in the long axis of the pylorus; the stomach was now replaced altogether. The general cavity of the peritoneum as well as the wound area were abundantly douched with hot water (boracic lotion was employed in the absence of salt solution), sousing the coils of intestine, &c., by flapping the abdominal walls with the hands while the water was poured in from a large jug. What fluid remained was then sponged out. On further search a large accumulation of turbid yellow fluid was found behind the bowels and below the liver. This area or pouch (which has been specially described by Rutherford Morison[3]) was drained by a large rubber tube brought out in the loin below the right kidney. Lastly, I made a fresh incision in front below the umbilicus and pushed the largest glass tube right down into the pouch of Douglas; this procedure was rewarded by the gushing out of a large quantity of opaque yellow watery fluid and large flakes of lymph. Hot water was driven down the glass tube in large quantity and then sucked up again. The main wound was closed. It should have been mentioned as indicating the reviving powers of the hot water irrigation that bloodvessels which had not been seen or secured by forceps started to bleed quite freely and required ligation. Strychnine was given hypodermically, and whisky and hot water per rectum. The supra-pubic drain-tube was sucked up every half-hour in the first instance and later every two hours. After an hour he woke up from the chloroform and said he felt distinctly easier although very weak. For three days his condition remained very critical; he vomited quantities of brown watery fluid although he was having nothing by the mouth but the moistened corner of a handkerchief to suck and chew. He retained all the nutrient enemata. On the fifth day the drainage tubes were withdrawn. On the sixth day he was allowed peptonised milk by the mouth *ad libitum*, and *post hoc* or *propter hoc* he did not vomit again. He also had brandy and soda-water. On the thirteenth day, when it appeared that he was going to get well, he began to go down hill again, losing strength, the pulse growing irregular and rapid, the temperature, of the intermittent septic type, varying from 100° to 104° F., and the respiration being as frequent as 40 per minute. The wound in the abdominal wall was opened up as far as the peritoneum as there was purulent cellulitis in its vicinity. He never vomited, although he took quantities of nourishment, but gradually sank and died on the 17th—the seventeenth day after the operation.

Necropsy.—Dr. Muir, pathologist to the Infirmary, kindly supplied me with the following notes of the post-mortem examination: "The suppuration in the abdominal wound did not extend to the peritoneum. The peritoneal cavity was quite dry; here and there were recent adhesions between the coils of intestine. There was no infection of the membrane or other sign of recent inflammatory change. In the upper part of the abdomen the various structures were adherent to the parietal peritoneum in the region of the wound in the abdominal wall. At the pylorus the external conditions were quite satisfactory. A portion of the great omentum had become firmly adherent over the anterior wall of the pylorus so that the line of invagination could not be seen. The stomach was dilated and contained several ounces of dirty grey fluid; the lumen at the pylorus was much contracted and only allowed the passage of the little finger. On dividing the posterior wall and inspecting the anterior wall from within one could see no trace of invagination; the ulcer itself was only recognisable as a smooth, circular, shallow depression; in other words, it was soundly healed. The kidneys presented slight general interstitial changes. The right lung weighed 3 lb. 14 oz., and was entirely consolidated with the exception of portions of the anterior margin; there was recent pleurisy on the surface. On section the lower lobe showed advanced grey hepatisation passing into a diffuse suppurative condition, the whole tissue being of a whitish-yellow colour, and here and there breaking down into irregular cavities containing a pinkish purulent material. At the upper part of the lower lobe there were one or two circumscribed abscess cavities. The upper lobe showed a somewhat early pneumonia along with much œdema. The left lung weighed 2 lb. 1 oz.; on section it showed marked general catarrh and extreme œdema, probably a hypostatic condition."

I think it is a reasonable assumption that this patient would have survived had he not been so run down by starvation and by continued vomiting of septic material from his stomach. The pneumonia, from which he died, while lobar in distribution, was probably septic in character (although no organisms were found in specially stained sections), and owed its origin to the inhalation of septic material. The operation was successful so far as repairing the perforation of the ulcer and the recovery of the infected peritoneum were concerned. Had he survived it is probable that the pyloric stenosis which was unavoidably produced in closing the perforation would on an ordinary diet have been attended by vomiting and other symptoms of dilated stomach. The stenosis, however, could have been remedied by a subsequent operation (pyloroplasty).

I shall now pass on to the consideration of the second group of cases referred to in the introduction to this paper, those in which, in the absence of any suspicion of the existence of a gastric ulcer, the patient is suddenly seized with the phenomena of perforation. The type of this group is more often a man between the ages of twenty-five and forty years who has made light of, or put up with, any digestive trouble from which he may have suffered, and who, it may be, without any warning, in the prosecution of his daily work, not uncommonly after a meal, is suddenly seized with abdominal pain and faintness, so that he is obliged to make his way home to bed, where he lies in great suffering. Only about one-third of such cases actually vomit. The medical attendant on arrival is confronted with

[2] I am indebted to the courtesy of Professor T. R. Fraser for the notes given above.

[3] Brit. Med. Jour., Nov. 3rd, 1894.

an apparently robust man who has been suddenly seized with illness and who manifests signs and symptoms pointing to an acute and recent abdominal lesion; the physician runs over in his mind a list of conditions including poisoning (by accident or otherwise), the different lesions giving rise to acute obstruction of the bowels, appendicitis in its most aggravated form, and, lastly, perforation of a gastric (or duodenal) ulcer. The knowledge that hesitation and delay may entail disastrous consequences increases his difficulty and his responsibility. That death may occur within twenty-four or more hours and that the sectio may reveal a gangrenous loop of bowel, a sloughing appendix, or a perforated ulcer of the stomach should not be excluded from his anticipations. Instead, therefore, of injecting morphine and ordering hot fomentations he must either endeavour to arrive at a diagnosis himself or seek the assistance of a colleague for that purpose. The diagnosis of perforated ulcer, whether of the stomach or duodenum, is to a certain extent one of exclusion, great assistance being obtained by the localisation or predominance of the signs above the umbilicus (especially under chloroform) and from the previous history of the patient. The following is a typical instance of this group of cases.

CASE 3. *Perforation of an unsuspected gastric ulcer; operation twenty-four hours later; recovery.*—A postman forty-one years of age was admitted to the Edinburgh Royal Infirmary on Feb. 26th, 1896, on the recommendation of Dr. Sloan, suffering from severe pain in the abdomen and vomiting. He was stated to be suffering from obstruction of the bowels. He had always been strong and healthy. For the past five or six months he had complained of discomfort and waterbrash after food. Two months previously to admission he had an attack of pain and vomiting. Since then he had every now and then had indigestion and used to take some whisky before starting on his morning rounds. He suffered most after supper at 10.30 P.M.; towards midnight the pain set in and he occasionally vomited a mouthful of sour phlegm, especially on coughing. He never vomited blood. He occasionally had an attack of diarrhœa. The stools were always natural in colour. At 11.30 A.M. on the day before his admission while delivering letters he suddenly felt dizzy and ill with pain in the abdomen in the region of the navel. He reached home with difficulty and went to bed. When seen by Dr. Sloan he was in great pain and vomiting, the vomited material being green in colour. A morphine suppository and lead and opium fomentations were ordered. Dr. Sloan saw him again towards midnight, and as there was no improvement sent him into the Infirmary. In the absence of Professor Annandale I saw him at 11 A.M. on the 26th; he was obviously very ill. The abdominal pain was less severe than it had been and the abdomen was a little distended, the walls not moving with respiration. The pain and tenderness, although complained of all over the abdomen, were more pronounced above the umbilicus. The liver dulness was not diminished and it extended to the costal margin. The pulse was sharp and wiry, being 85, the temperature was 97·4° F., and the respiration was 50. I had the advantage of consulting with Dr. G. A. Gibson; we considered that the diagnosis lay between a perforated ulcer and acute appendicitis, so little was the tenderness or resistance limited to one particular area of the abdomen. Under chloroform the general rigidity of the abdominal wall disappeared and we could distinctly recognise a greater fulness and resistance above the umbilicus. I opened the abdomen between the ensiform and the umbilicus at 11.15 A.M. (twenty-four hours after the supposed perforation). A quantity of gas and clear, thin, yellow fluid escaped; floating in the fluid were flakes of lymph, clots of milk, and fragments of egg; the fluid was noticed to come from above in gushes synchronous with the respirations. The distended transverse colon and the omentum were displaced downwards; the pyloric segment of the stomach which then presented was also displaced downwards; on raising the liver a quantity of thick yellow lymph was found between it and the body of the stomach and investing both viscera; a circular hole was then recognised on the anterior wall of the stomach, nearer the lesser than the greater curvature and nearer the cardia than the pylorus; the hole was the size of a threepenny-piece, and from it there escaped with each inspiration gushes of stomach fluid contents. While the fluid was soaked up with sponges a tube was passed down the œsophagus and the remaining contents of the stomach were withdrawn. Having pulled the stomach down into the wound the area around and including the ulcer was invaginated by a series of eight Lembert silk sutures. A second incision was made below the umbilicus and a large glass tube passed into the pouch of Douglas; through it there escaped a large quantity of turbid, yellow, flaky fluid. In the absence of salt solution the abdomen was washed out, as in the preceding case, with quantities of hot water, with dilute corrosive sublimate (1 in 10,000), and finally with boracic lotion. Any fluid remaining was soaked up by sponges; to these there adhered also a quantity of yellow lymph. The main hour. The tube in the pouch of Douglas was sucked dry wound was then closed. The whole procedure lasted one every quarter of an hour during the first twenty-four hours. The next day he was wonderfully well; the pulse was hammer-like or jerky, the abdomen was blown up but less tender, and the fluid coming from the drainage-tube was quite clear and sweet. An enema of turpentine was returned. On account of the thirst and flatulent distension of the abdomen I ordered him a Seidlitz powder, which he much enjoyed. The same night he vomited a large quantity of dark brown watery fluid and passed flatus; thereafter he was much easier. On the third day he was taking plenty of peptonised milk and whisky by the mouth. Without going into further details he made an excellent recovery; his convalescence was a little prolonged by suppuration in the abdominal wound. Four months after the operation he was strong and well and was found to have gained a stone in weight; his diet, however, still requires regulating, inasmuch as any indiscretion is followed by discomfort and waterbrash.

The time at which the operation should be performed in cases of perforated ulcer is an element of much importance. In an able summary of all reported cases recently published by Dr. R. F. Weir of New York[4] it is conclusively shown that, other things being equal, the mortality bears a direct relation to the time which has elapsed before the operation. It does not seem to me to be a wise recommendation on the part of some writers that one should wait until the shock of the perforation has passed off. Surely the chief cause of the severity and persistence of the shock is the escape of septic material into the peritoneum and not the existence of a little hole in the stomach. The operation is, therefore, the logical treatment for the shock because it removes the cause of it. I have taken the responsibility of opening the abdomen on several occasions during the period of shock following the rupture of an abdominal viscus and I have always observed that instead of increasing the shock by the anæsthetic and by the operation the vitality of the patient has been at once improved; this is especially to be observed after the intraperitoneal extravasation has been got rid of and the cavity flushed with hot water; the patient will tend to "come out" of the anæsthesia, and vessels which have been overlooked because empty commence to bleed and require to be secured. It is to be borne in mind that in septic extravasation, as distinguished from blood or normal urine, the symptoms of shock tend to merge imperceptibly into those of peritonitis or peritoneal septicæmia. When confronted, therefore, with a case of perforated ulcer the procedure recommended is to give some stimulant by the bowel (whisky and hot water) and strychnine hypodermically, and at once make the preparations necessary for the operation. These, in addition to a few instruments in every-day use, include silk stitches, sponges, large drainage-tubes, and several gallons of hot boiled water. A good light and an assistant with capable fingers are valuable accessories.

The method of dealing with the perforation when found.—Mr. Pearce Gould, in introducing the discussion on the operative treatment of perforated ulcer at the British Medical Association meeting at Bristol in 1894, recommended the invagination of the area occupied by the ulcer and condemned the practice of excising the latter or of paring its edges. Surgeons are practically unanimous in their support of these recommendations. A considerable area of stomach wall is to be included by the invaginating Lembert sutures. That this method of closure is absolutely trustworthy is evidenced by one of my patients swallowing an effervescing Seidlitz powder with impunity and with benefit upon the day following the operation. In the less accessible situations sometimes affected by the ulcer the suturing is made easier if a Hagedorn's needle and holder are employed and if a continuous suture be substituted for interrupted stitches.

[4] Medical News, April and May, 1896.

In the not uncommon cases where the ulcer involves the pylorus itself the necessary invagination may entail an undesirable degree of stenosis if the suture line correspond with the long axis of the pylorus (*vide* Case 2). It is better practice, therefore, to make the suture line at right angles to its long axis, following the principle of the Heincke-Mikulicz operation (pyloroplasty) for pyloric stenosis.

The method of dealing with the extravasation into the peritoneum and the prevention of peritonitis.—The importance of this step in the operation was well emphasised in Mr. Pearce Gould's address to which I have already referred.[5] The fluid used for flushing is preferably saline solution (¾ per cent.) or boiled water; it must be hot (105° to 110° F.) and there must be plenty of it. Pouring from a large jug is better than any syringe; the fluid is moved about inside the abdomen by agitating the wall with the hands and turning the patient from side to side. Special attention in every case is to be directed to the space between the stomach and liver, to the pouch below the liver described by Rutherford Morison, to the large space below the great omentum and mesentery, and, above all, because so liable to be overlooked, to the pouch of Douglas. Any fluid which remains is to be soaked up with sponges. I do not think it is necessary or advisable to remove the lymph which may be found coating the peritoneum; it is laborious, depressing to the patient, and necessarily imperfectly performed. The lymph may be regarded as a natural and harmless product, and if the patient survive it is rapidly re-absorbed. I am not so convinced of the necessity of drainage by tubes, but have always had recourse to it where there is general infection of the peritoneum; the most important tube is that inserted by a separate wound into the pouch of Douglas; it should be of large size, and it should be sucked dry at frequent intervals, according to the practice introduced by the late Thomas Keith. A second tube may be brought out in the loin posteriorly below the right kidney to drain the lumbar pouch. A third may be arranged to drain the area of the ulcer itself, but it is the least essential of the three. The wound in the abdominal wall is apt to be infected in the early stage of the operation by the septic fluid escaping from the peritoneal cavity; its edges should therefore be carefully cleansed before being brought together, and any subsequent suppuration is to be watched for and treated on general principles.

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GOUT IN RELATION TO LIVER DISEASE.

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THE clinical tendency of the period is to divide and subdivide diseases and to attach to each division a specific name—a plan which, though possessing advantages in a tutorial sense, is highly detrimental to the practice of medicine in a therapeutical point of view. For just as there is a correlation in the physical forces of nature—heat, light, motion, and electricity being transmutable into one another—there is in like manner a correlation, not only in physiological functions, but pathological process. So closely intertwined, indeed, are the functions of some of the organs that they can successfully for a time vicariously perform the functions of each other. This being the case, if our aim be to treat diseases philosophically instead of by old empirical rule of thumb methods, in formulating a line of treatment for any particular disease we must always take into account, collectively as well as individually, the influence the functions of every organ in the frame may have on the course of the disease under consideration. For no individual part of the body is an independent entity. The deeper one goes into the etiology of disease the more apparent does this become. Having already shown the close relationship existing between liver derangements and certain forms of curable diabetes[1] I wish now to direct attention to the strong relationship existing between gout and hepatic derangements. In order to make the article as instructive as possible the facts have been put as nearly as could be conveniently done in strict chronological order. And from doing so I fancy it will surprise not a few of its readers to learn that the intimate connexion existing between gout and liver was prominently brought to the notice of the profession more than a century ago by a surgeon of the name of Murray Forbes in a work entitled "A Treatise on Gout and Gravel."[2] His remarks on the subject are all the more surprising from his not only having pointed out how gout goes hand-in-hand with urinary and biliary calculi, but correctly foreshadowed some of the more recently promulgated doctrines regarding the part played by uric acid in the causation of these diseases. For example, he stated that lithic acid (the name then given to uric acid), which Scheele had eleven years before found was the main constituent of all gout-stones, as well as of the majority of urinary calculi, was always in excess in the system before a paroxysm of gout. And not only so, but he believed that it was the liver that regulated the formation of this substance—an idea all the more remarkable seeing that without modern knowledge, unless he was something of a prophet, this idea could be but little else than the offspring of fortuitous guesswork, seeing that it is only within the last couple of decades that chemical pathology has furnished the requisite data for the formation of such a theory. Stranger still is the fact that he distinctly tells us in the technical language of the period that "when the acid loses its combination with the alkali or earth it appears in the urine as a preternatural sediment under various shapes, and when the proportion is greater in any situation of the body than can be retained in solution by the fluids of the parts a concretion of particles takes place so as to form in the urinary passages gravel and calculi and in other places, especially in tendons and ligaments, from circumstances in their nature and circulation pre-inclining to the effect, a deposit which becomes the cause of gout." And he adds that "biliary concretions proceed from the same sources as gravel and gout," at the same time warning us that "these three diseases are not of necessity always present in the same habit." It is, indeed, noteworthy that ere the dawn of chemical pathology, as we now understand it, had so much as begun a, of necessity, defectively educated professional brother should from mental reflections alone have been led to propound a theory of diseased action which all the increased technical knowledge of a century has only within the last few years succeeded in experimentally demonstrating.

The next writer of note who called particular attention to the close connexion existing between gout and liver was Sir Charles Scudamore, who in 1823 considered himself justified to speak of a "gouty hepatitis,"[3] from his having noticed that there was a form of inflammation of the liver often accompanying gout which had to be got rid of ere the acute paroxysm of gout could be overcome. "The only method of cure for the gout," he says, "is the adoption of a treatment suited to restore the action of the liver to health." And in proof of the assertion he cites the case of a man aged forty years, "with a strongly bilious diathesis (in whose family gout was unknown), who, after having had yellow fever in the tropics and been severely jaundiced, was first seized with an attack of gout in the great toe, and afterwards at varying intervals with violent paroxysms of the disease in both his hands and feet. In union with this much jaundice was present, a furred tongue, loss of appetite, depression of spirits, the urine of a deep colour and depositing lateritous sediment, fæces of a dark green colour, and in every respect indicating bilious derangement, the right hypochondrium being also tender on pressure." "I directed," he says, "in this case repeated purgatives of calomel and colocynth together with the colchicum draught ..... it quickly relieved the pain ..... he gradually lost his jaundice and the liver ceased to be tender on pressure."

Trousseau and Strumpell have also referred to the connexion of gout and acute inflammation of the liver as well as described cases of what they call gouty cirrhosis. This is not astonishing seeing that every liver that has been severely or repeatedly inflamed gets after a time into a state of chronic hypertrophy—so-called hypertrophic cirrhosis—and while it is in this condition in consequence of its secreting cells being pressed upon by the hypertrophied

[5] "No time or care must be spared to make the flushing absolutely thorough; it is the essential vital step in the whole operation—the one upon which success or failure chiefly hangs."

[1] Brit. Med. Jour., 1893.

[2] The first edition of the book was published in London anonymously in 1786 and the second under his own name in 1793.

[3] Treatise on Gout and Gravel, London, 1823.

intercellular fibrous tissue they gradually shrink, and so in the end the liver becomes both small and hard—cirrhosed. Strumpell, while attributing the cirrhosed condition of the liver to the deleterious effects of uric acid upon its parenchyma adopts Scudamore's view that gout is the cause and not the effect of liver disease. Murchison said gout induced jaundice, gall stones, and biliary catarrhs. The majority of our contemporary pathologists, however, think that the gout springs from the liver disease and not the liver disorders from the gout. Trousseau even went further, for when I attended his lectures he told us that gout was not in itself a disease, but only a sign and symptom of liver derangement, in the same way as the eruption in small-pox is not the disease, any more than the sore throat of scarlet fever, but a mere symptomatic manifestation of a constitutional morbid state. I am not quite prepared to endorse so sweeping a theory, for though I admit the existence of several clinical facts strongly pointing in its direction I do not think that they are sufficiently conclusive to warrant its unreserved adoption.

In his Croonian Lecture at the Royal College of Physicians of London in 1886 Professor Latham also called attention to the close intimacy existing between gout and liver derangements. Indeed, it is impossible for anyone who has given attention to the subject not to be impressed with it, and any one who has kept notes of gout cases will see by referring to them that by far the majority of the patients have been bilious subjects. Not only so, but if he has had many severe gout cases he will also be forced to believe that not only is uric acid gravel, but diabetes a very common accompaniment of gout. This is only what might be expected, seeing that uric acid calculi are almost invariably associated with liver derangements; and there is a special form of diabetes depending upon liver disorders known under the title of hepatic diabetes, just as there is one of albuminuria, known as hepatic albuminuria.[4]

Murray Forbes said that gout, diabetes, renal calculi, gallstones, and jaundice may all occur in the same patient. In order that the reader may not suspect me of manufacturing a case to confirm the statement, I shall furnish him with one whose authority is beyond dispute, seeing that it is none other than that of the renowned Scottish novelist, Sir Walter Scott, extracted from his own Diary,[5] and thereby rendered all the more valuable from the fact that the account he gives of his clinical history is alike unbiased by medical dogma and personal theory, for he was a lawyer and not a medical practitioner.

Sir Walter tells how he had to diminish the use of alcohol "for fear of a weakness in the direction of diabetes, a disease which broke up my father's health." He also says he "was seized with a most violent pain in the right kidney," which Dr. Clarkson diagnosed as renal "gravel augmented by bile."

In Lockhart's life of Scott it says he occasionally suffered agonising pain from the passing of gall-stones accompanied with jaundice. Sir Walter himself describes more than one of "these excruciating attacks." Moreover in various parts of his Journal Scott refers to the violent attacks of gout he had at different times in his feet, knees, gums, and back, comparing the pain to a "scorpion's bite," and its intensity as being sufficient to make him "howl."

As is the case with most "livery" subjects Sir Walter Scott was subject to fits of great mental depression. Alluding to one of these in 1826 he says it was accompanied by "a fluttering of the heart" and a feeling as if he "knew not what was going to befall" him.

Like many other gouty and "livery" people Sir Walter Scott ultimately died from apoplexy, so that his is a most instructive case of hereditary liver derangement, associated with gout, diabetes, renal calculi, and gall-stones, and ending in apoplexy.

When all the foregoing hepatic pathological data are considered it is evident that gout in different people must require entirely different forms of treatment. And in order to treat a case philosophically each individual constitutional peculiarity must be prescribed for quite as carefully as the special condition denominated gout, for while one patient may be benefited by colchicum it may on another act as a poison. Carbonated alkali does good to one, and iodide of potassium acts like magic on another; whereas, as Scudamore discovered, many require their livers to be set to rights before any gout remedy whatever is of the slightest use. This is one of the reasons why several of the vegetable purgatives, in combination with quinine and digitalis, have been vaunted by some of our continental *confrères*, and mineral waters by others as podagra specifics. But the curative effects of both the one and the other of them spring mainly, I believe, from their hepatic action. Piperazin, salicylate of soda, diuretin, and guaiacum are all useful in certain cases. Exactly in the same way different gouty constitutions tolerate different wines. It may, however, be laid down as a general rule that the less acid and the less alcoholic a wine is the less likely is it to disagree with a gouty patient. Hence it is that the sour forms of champagne at present sold in England should in all cases be shunned, no matter what one is told by the uninitiated to the contrary. Champagnes such as the French themselves drink are the safest, for that sugar gives gout is alike contrary to scientific observation and everyday practical experience.

Again while hot applications with anodyne liniments and hot alkaline fomentations are of marked benefit to some, I know from personal experience that ice applied to the painful part until the skin over it is frozen will occasionally give immediate relief. Massage again, either moist or dry, when it can be tolerated often greatly expedites the cure.

Gout is such a protean form of disease that no special line of treatment can be formulated for it as a whole, each constitution and each individual paroxysm requires to be treated according to its own special conditions.

Harley-street, W.

[4] Diabetes: Its Various Forms and Different Treatments; Albuminuria, with and without dropsy, by the writer. Walton and Maberley, London, 1872.

[5] Sir Walter Scott's Journal, Douglas, Edinburgh, 1890.

GANGRENE OF THE LEG IN PUERPERAL WOMEN, WITH SEVERE PAIN IN, AND ANALGESIA OF, THE AFFECTED LIMB.

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OF the accidents which befall women in, or shortly after, their confinement, and which are not immediately fatal, I know of none more painful to the patient or more disappointing to the friends than blocking of a large artery at some distance from the heart and the consequences which follow. It has been my fortune within the last few months to have seen in consultation with medical friends two such cases of sudden blocking of the popliteal artery, and as this happily is rather an uncommon complication of the puerperal period, many obstetricians of even large experience never having observed it, the rarity of the event, the extremely painful nature of the illness, and its anxious character are my excuse for bringing the following details before the notice of the profession.

CASE 1. *Right brachioplegia with transitory difficulty of speech occurring fourteen days after confinement; popliteal thrombosis; gangrene of foot and leg; amputation; recovery.*—A married woman aged twenty-three years, a healthy primipara, was delivered by Dr. Leech of Newcastle on October 1st. The confinement was normal. Fourteen days afterwards, when up and apparently quite well, she fainted and would have fallen. On being placed in bed it was noticed that she had lost the power of her right arm, that the corresponding side of her face was slightly paralysed, and subsequently that she had great difficulty in speaking. The right leg was not affected. Next day the paralysis of the arm had, practically speaking, disappeared, but in the evening she complained of severe pain and numbness in her right foot and in the calf of the leg. Within a few hours after this the big toe had become gangrenous and a dusky erythematous patch was present on the lowest two-thirds of the leg. Next morning, when I saw her with Dr. Leech—that is, the third day after the fainting and the second after the pain in the foot—the pulse was 104, and the temperature 99° F. Speech had returned, the pupils were normal, there was no longer any facial paralysis, and the brachioplegia had disappeared. The right leg was gengrenous; it was bluish-black three inches above the ankle, whilst the big toe was perfectly black and covered with large blebs, some of which contained bloody fluid and

others serum. The skin of the leg elsewhere was extremely pale and cold; the veins were small and no pulsation could be felt in the arteries at the ankle. The leg was painful on movement and yet there was complete loss of the sensation of touch and pain, as tested by the prick of a pin as far upwards as two inches above the knee-joint. Pain, too, was complained of along the course of the large arteries and veins. It was a moist gangrene, there being large blebs as high up as the top of the calf. The left leg appeared to be normal although the patient complained of pain in the heel. The urine was free from albumin. The sounds of the heart were healthy. They were perhaps a little louder than usual, but the organ was beating rather vigorously. Stimulants were repeated; a mixture of digitalis and ammonia was ordered and external heat carefully applied. Two days afterwards, as the gangrene was spreading rapidly, it was decided at our consultation, even in the absence of a distinct line of demarcation, to amputate the limb. Dr. Leech, assisted by Dr. Metcalfe, there and then removed the limb, amputating it about three inches above the knee-joint. The anæsthetic was well borne. On cutting open the leg subsequently both the popliteal artery and veins were found to be filled with clot, that in the artery reaching up to within a very short distance of the lower border of the incision made through the skin at the operation. The patient, after rallying from the shock, made an excellent recovery and in a letter received some months afterwards from Dr. Leech he informed me she was then moving about quite well by means of a crutch and that her general health was good.

CASE 2. *Pneumonia four days after confinement; endocarditis followed by embolism of the right popliteal artery; gangrene; amputation of leg; death nineteen days afterwards from a recurrence of pneumonia and exhaustion.*—At midnight on January 25th of this year I was requested by Mr. Galbraith of Gosforth to see with him a married woman aged twenty-five years who had been delivered of her second child on the 14th. The infant had been born before the medical attendant arrived. The nurse who separated the child from the mother had allowed the patient to remain uncovered for a time and to lie in the wet. On his arrival Mr. Galbraith found the patient cold and inclined to shiver. The placenta which was lying in the vagina was at once removed. Nothing of any moment followed within the next three days, but on the 18th there were signs of pneumonia in the right lung; the temperature had risen suddenly to 103·5° F. and the pulse to 120. The patient for the next few days progressed as favourably as could be expected. On the 23rd the sputa were rusty, and next morning the expectoration was bloody, but not abundantly so. In the course of the afternoon of the 24th she was suddenly seized with pain of an excruciating character in the calf of the right leg, but as nothing could be seen or felt in it, the limb was carefully covered and gentle heat applied to it. It was early morning on the 26th when I saw her with her medical attendant. The pain in the leg for the previous thirty hours had been very severe. We found the patient propped up in bed in a semi-recumbent position looking extremley ill; her eyes were large and staring. She was worn out for want of sleep and was exhausted by pain. Her respirations were 30 to the minute, the face was flushed and slightly cyanosed, and she was perspiring freely. The tongue was moist and clean. The bowels had been moved on the previous day. The temperature was 103° and the pulse 138. The heart was beating very excitedly; its impulse was diffused. Over the mitral area a loud, rough systolic murmur could be heard and some pericardial grating, whilst at the aorta the sounds were normal. The left lung, which was dull on percussion, was the seat of small crepitating râles, heard almost from the apex to the base at the back and front. Small crepitation was also heard over the base of the right lung. The abdomen presented nothing abnormal. A vaginal examination was not considered necessary. The lochia had ceased three days before this, but there had been nothing peculiar about it, no odour, &c. There was milk in the breasts. The right leg was very pale and cold to the touch. The right calf was swollen and measured twelve and a quarter inches, whilst the left was eleven inches. No pulsation could be felt in the lower part of the popliteal space; there was none on either side of the ankle, and very little high up in the popliteal artery itself. There was complete anæsthesia of the skin from the sole of the foot to two inches and a half above the knee joint. On the sole of the right foot there were two or three large, bluish-red circular patches with a pale centre, and the skin over the instep showed a few small hemorrhages. Here and there all over the foot and the lower part of the leg there were numerous small spots like purpura hæmorrhagica. As the patient was suffering from shock and loss of sleep through pain we decided to continue the stimulants she was taking, to maintain as far as possible the heat of the limb by covering it with cotton wadding, to administer opium to procure sleep and relieve pain, to quieten the heart and improve the circulation by means of a digitalis, ammonia, and spirit of chloroform mixture, and to administer strong soups, all in the hope of rallying her and placing her in the most favourable condition for having the limb removed when possible. The opium gave the much-needed rest and the treatment answered satisfactorily. When I saw her again on the 27th she looked better; she was now able to talk more freely owing to the breathing having been relieved. She had slept well the previous day, but that morning the pain had returned with undiminished severity below the knee. Her temperature was 100°, her pulse was 100 and of better volume. The left lung was clearer and there were fewer râles in it. The heart was beating more steadily, but the mitral systolic murmur was still very loud and rough and heard well at the inferior angle of the left scapula. Sensation and warmth had returned to the right leg to two inches below the knee-joint, but all below this was insensitive to the prick of a pin and was icy cold. The bluish patches already mentioned had extended. The lochia had returned and was healthy though scanty. The urine was examined and found to be quite free from albumin and sugar. On the 28th the pain in the leg was extremely severe; it was referred to the popliteal region just above the knee and was deeply situated. The gangrenous patches had extended; the pulse was 130 and the temperature 102°, whilst the tongue remained moist and clean in spite of large doses of opium given to relieve her sufferings. The right calf was still increasing in size; it now measured thirteen inches. The lungs were improving, but the mitral systolic murmur was still very loud, whilst over the aortic area for the first time a soft systolic murmur was heard, followed by a loud accentuated second sound. It was now evident that unless the limb was removed she could not recover. The gangrene was rapidly extending, and as she had rallied as much as she possibly could and would under the circumstances Dr. Hume, who consulted with us, confirmed our opinion as to the advisability of the amputation and removed the leg a few inches above the knee, Mr. Galbraith administering the anæsthetic. She took the anæsthetic (A.C.E. mixture) well. The operation of itself was quite successful. On dissecting the leg I found in the popliteal artery a large firm clot extending into the two bifurcations of the vessel. The interior of the clot was decolourised. There was no redness of the endarterium. All the veins of the leg contained dark clotted blood. The gangrenous skin on being cut into exhibited a greyish-brown discolouration, with here and there numerous small black clots. The soleus muscle when sliced was seen to be swollen, soft, and watery; it was the seat of numerous small hæmorrhages and even its minutest blood vessels were filled with black clot. The muscle evolved a very strong putrefactive odour. The blood clot in the popliteal artery after careful staining did not reveal the presence of any microbes. The failure to detect them is no proof of their non-existence. Five days after the operation when I again saw the patient there was some sloughing of the skin flaps. The operation had given her all the relief that we had hoped for, and clearly it had given her the only chance of recovery. The progress of the case, however, had not been quite so satisfactory as we had desired. From the sloughing of the surface of the wound and the putrefactive odour in the room it was apparent that there were dangers ahead. I did not see her again, but I learned that the pulmonary symptoms returned, her temperature rose, and that she died from sheer exhaustion and pneumonia, probably septic, on Feb. 17th, nearly three weeks after the operation.

In these two cases of rapidly extending gangrene of the leg occurring in lying-in women three points stand out prominently — viz., vascular obstruction, agonising pain, and analgesia and anæsthesia of the affected limb. In the first case the suddenly developed brachioplegia and rapid recovery suggest a slight cerebral thrombosis, whilst the sudden vascular obliteration followed by gangrene of the foot and leg were probably consequent upon the action of a poison causing clotting of the blood. As regards the second patient, of the state of whose heart

anterior to her last confinement we have no knowledge, it is probable, assuming that organ to have been healthy, that the pneumonia which developed within the first week after her delivery was septic, that it was followed by endocarditis of an ulcerative character, and that from the valves of the heart vegetations were carried into the right popliteal artery causing sudden blocking of the vessel. The veins of the affected limb in each instance were filled with clot. Under ordinary circumstances simple arterial blocking would of itself scarcely cause such rapidly developing gangrene. The other points of interest are the severe pain in the foot and leg generally, the complete loss of the sense of touch and pain in the skin, not only of the foot, but of the leg, for three inches above the knee-joint—i.e., above the location of the clot in the artery. We can readily understand how in a foot, the toes of which are blackening with gangrene and whose skin is bullous, there should be loss of sensation; but why arterial obstruction below the knee should be so quickly followed by absolute loss of the sensation of touch, heat and pain in the skin of the limb above as well as below the point of arterial obliteration, and why surface analgesia should be associated with agonizing pain in the affected foot and in the leg generally, are circumstances not so readily explained. The sudden and complete loss of the sense-receptivity of the nerve-endings in the skin over such a large area suggests a central lesion, for in the earliest stages it seems to have been too diffused to have been due to a peripheral cause, and yet the severe pain suggests the probability of the latter. If so, then to what must the pain be attributed? It was in 1858 that Charcot drew attention to "claudication intermittente des extremités" as an explanation of the severe pain which occurred in a peculiar illness occasionally observed amongst men and women and which was at times followed by gangrene necessitating amputation of the limb. Charcot got the phrase from Bouley and applied it to the disease in question. Bouley had observed horses become suddenly affected in their hinder extremities so that they limped and seemed to be in great pain. If when in this condition they were whipped the animals would fall down apparently in acute suffering, not from the effects of the lash, however, for there was distinct anæsthesia of the surface associated with rigidity of the limb. These phenomena would quickly disappear and the animal shortly afterwards would seem quite well, but if again whipped the phenomena returned. When a horse under these circumstances was killed the main artery of the affected limb, or the abdominal aorta if both legs had been involved, was observed to be obliterated, either by a thrombus or by pressure of a tumour from without. In cases such as these it was maintained that sudden occlusion of the artery by depriving the muscles of the limbs of their normal nutriment threw them into a state of extreme spasm, or that the waste products accumulating in the muscles had so irritated their nerve-endings that reflexly the muscles passed into a state of extreme contraction. On the theory, therefore, of severe muscular cramp Bouley sought to explain the severe pain, and to some of the readers of this paper it might seem as if this was the explanation of the acute suffering that occurred in these cases of puerperal gangrene. Pain in a limb affected by commencing gangrene may be paroxysmal, but muscular spasm has not seemed to me to be a likely explanation of it. In neither of the two cases just reported could I detect anything like rigidity or hardening of the muscles under the hand. The pain was occasionally felt in the foot or diffused over the limb generally; sometimes it was several inches above the site of vascular obstruction, sometimes it was below it. Whilst, therefore, admitting muscular spasm or "claudication intermittente" as a possible explanation of the pain it is not sufficient. The severity of the deep-seated pain and the loss of surface sensibility suggest a nervous lesion—e.g., a rapidly developing peripheral neuritis, or that there may have been irritation of nerve-endings in the walls of bloodvessels, which in gangrene are known to be in a state of extreme contraction.

There is now recognised, thanks to the labours of Lanceraux and others, a form of gangrene described as neuropathic in which patients, after complaining for years of pain in a limb, have gladly submitted to removal of the offending member for relief to pain which is so exhausting as to have caused death, and when amputation has not been performed the illness has been followed by gangrene. There are practically the same symptoms as in "claudication intermittente" and on cutting up the limb the appearances presented by the muscles closely resemble those observed in my own cases of puerperal gangrene. The arteries, however, are found to be thickened at their extremities whilst at other places they are free, but the nerve centres and nerve trunks are the seat of the pathological changes met with in neuritis. One feature said to be specially characteristic of this neuropathic form of gangrene is the long-continued pain. Whilst the gangrene of puerperal women is distinguished from the neuropathic form by the absence of the long-continued prodromal period of pain, is sudden in its onset, and is of rapid development, for the foot and leg become gangrenous in a few hours, also that the gangrene is rather moist than dry, the nerves, in spite of their connexion with the nutritional centres in the spinal cord, become rapidly affected, the morbid changes resembling those met with in inflammation followed by degeneration. Why they become thus affected it is difficult to say, but it is probable that in the rapid death *en masse* of the tissues that surround the terminations of peripheral nerves their endings, no longer perfectly nourished from the centres and being in the midst of death, also die and in the act of dying cause pain. It is impossible to exonerate altogether the walls of the bloodvessels. These were healthy on microscopical examination, but the artery itself was firmly contracted upon the contained clot, and pain of a severe nature is not unknown in cases where arteries are in a state of extreme contraction or spasm.

The analgesia and anæsthesia of the skin deserve a word or two in passing although difficult of explanation. This loss of surface sensibility has received considerable attention from Sherrington, Herringham, Head, Patterson, and Mackenzie of Burnley. It is now admitted that the muscles of a given part of a limb and the overlying integument are not necessarily supplied by the same segmental nerves.[1] Segmental areas of skin are not supplied by their respective posterior spinal nerve roots, but "represent rather the parts of the skin in connexion with the segments of the grey matter of the spinal cord by means of fibres subserving the sensations of pain, heat, and cold, but not touch." How does this affect the question of occlusion of an artery being followed by loss of sensation in the skin? As the analgesia was present in both of my puerperal patients the possibility of hysteria has only to be mentioned to be at once set aside. The circumstance suggests problems to those who are still working in this line of research, for the areas of anæsthesia in my cases corresponded to the field of distribution of possibly the lower portion of the second lumbar nerve, and the third, fourth, and fifth lumbar nerves. It is now recognised that the large arteries of the body, like the abdominal viscera, are supplied by sensory fibres passing through the sympathetic system; hence the pain complained of might, as we have said, be due to changes produced in the walls of the arteries. There was nothing in my cases, at any rate, to support the theory of Ross of "referred pain," for the pain was not referred to areas from which one special set of sensory nerve fibres was proceeding. I can offer no adequate explanation of the loss of sensation of touch and pain over such a large area of the skin. This other fact, however, is apparent—that once complete occlusion of the popliteal artery occurred, then owing to the unhealthy blood and weakened tissue resistance, aggravated by increasing cardiac debility, the affected limb exposed to the influence of the air became a ready prey to putrefactive microbes, which, rapidly multiplying, extended through the tissues causing numerous sero-hæmorrhagic exudations, accompanied by considerable formation of gas, and to this external circumstance as well as to morbid internal states must be attributed the rapid spread of gangrene in these women after their confinement.

Newcastle-on-Tyne.

[1] Quain, vol. iii., part ii., p. 350.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.—An ordinary meeting of this society was held at Limmer's Hotel on Wednesday, June 17th, the President, Dr. Henry Lewis (Folkestone), being in the chair.—Dr. Theodore Williams gave an address on Sea Bathing and the Open-air Treatment of Disease. The address led to a discussion, in which the Chairman, Dr. William Ewart, Dr. Sansom, Mr. Haviland (Douglas), Dr. Snow (Bournemouth), Dr. Myrtle (Harrogate), Dr. G. Bennet (Buxton), Dr. Symes Thompson, and Dr. Gilbert (Tunbridge Wells) joined, and was followed by a very successful conversazione.

A CASE OF RUPTURED EXTRA-UTERINE PREGNANCY; TUBAL MOLE; INTRA-PERITONEAL HÆMORRHAGE; ABDOMINAL SECTION; RECOVERY.

BY ARTHUR H. N. LEWERS, M.D. LOND.,
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A WOMAN, thirty-four years of age, who had been married eleven years was seen by me in consultation with Mr. R. Ambrose on March 19th, 1896, at 3.30 P.M. She had had two children, the last six years ago; both her confinements were quite natural. She had had one miscarriage at about the sixth or eighth week four years ago. She got up immediately after the miscarriage, but went back to bed two days afterwards, and remained in bed for six weeks. She was then admitted into a hospital and remained there for six weeks longer on account of what she was told was peritonitis. As regards her present illness, she had menstruated regularly every four weeks till about two months previously. Jan. 25th was the last day of the last period. From that time she "saw nothing" until March 19th, the day on which I was called in to see her. For two weeks previous to this date she had had constant pain in the right iliac region, and several attacks of slight faintness, but she had not been obliged to keep in bed. On March 19th when she got up, while she was dressing she was seized with severe pain in the right iliac region accompanied by a severe attack of faintness, and she had to be assisted back into bed. At this time she had a slight loss of blood, this being the first occurrence of any hæmorrhagic discharge since the last menstrual period (Jan. 25th). I saw her for the first time at 3.30 P.M. on March 19th, when the particulars of the case already given were obtained. The patient at that time was extremely pale, the pulse was 108, and there was a marked tendency to syncope on the slightest exertion. It happened that the head of the bed was towards the window, and, in order to make a more satisfactory examination, I had the patient moved so that her head was at the foot of the bed. While doing this she almost fainted away, the pulse stopping for a few seconds. On examining the abdomen there was some fulness about the hypogastric region, and an indistinct sensation of a swelling there and in the right iliac region. But the lower abdomen was extremely tender, so that no very complete examination could be made. On vaginal examination, there was a little recent blood in the vagina, the uterus was distinctly less movable than normal, and there was an indistinct swelling to the right of it. The breasts had an active appearance. It appeared to me that the case was one of ruptured tubal pregnancy, and as the surroundings of the patient were somewhat inconvenient in the event of operation I had the patient removed in an ambulance to the London Hospital. I saw her again at 9 P.M. on the same evening; her condition then was decidedly worse than when I had seen her earlier in the afternoon; the pulse especially was weaker and more frequent. It had been 108 in the afternoon at half-past three, whereas at nine o'clock it was 120 and decidedly smaller. I therefore decided that abdominal section was the right procedure, and the patient and her friends readily agreed that it should be done. On opening the abdomen, there was a large quantity of blood free in the peritoneal cavity; on passing the hand down to the right, the right tube was drawn up to the wound, and was seen to be considerably enlarged. There was a rent in it somewhat anteriorly, from which a spongy substance was protruding; at this point bleeding was still going on. The uterine appendages on the right side were then removed in the usual way; the uterus was observed to be considerably and uniformly enlarged, and, indeed, as one has observed in several similar cases, had all the appearance of the pregnant uterus. On examining the appendages on the left side, it was found that these were by no means normal, for the left Fallopian tube was considerably dilated, being an inch or more in diameter, and accordingly I also removed the appendages on the left side. The abdomen was washed out with warm saline solution repeatedly, till all the clot and blood which had been effused seemed to have been washed away. A Keith's tube was inserted, and the abdominal wound closed in the usual manner. The patient made an uninterrupted recovery; the temperature after the operation was only once above 101° F., and that on March 22nd. I saw this patient on the 28th May, when she came to report herself at the hospital; she was then quite well, and the abdominal wound was soundly healed.

On examining the appendages removed, there was a large corpus luteum in the right ovary about three-quarters of an inch in diameter; the right tube had, as already mentioned, ruptured anteriorly, and from the rent a small portion of spongy tissue was projecting. Subsequent examination of a section of this spongy tissue showed that it contained an abundance of chorionic villi. The tube itself contained a hard clot, which, before the tube was opened, felt as if it might have been a fœtus; but no fœtus was found. The fimbriated extremity of the right tube was open. The left Fallopian tube, which was considerably dilated also, was found on section to contain a firm blood-clot. The wall of the left tube was extremely thin, very much thinner than the wall of the right Fallopian tube. The left ovary was somewhat large, but contained no corpus luteum. The fimbriated extremity of the left tube was closed.

Remarks.—There are several points of interest about this case. With reference to the etiology it will be seen that as regards the age and as regards the antecedent period of sterility the case was in accord with what one generally expects to find, for she was thirty-four years of age, and most cases of extra-uterine pregnancy are not younger than twenty-eight years of age. The antecedent period of sterility was considerable, the last child had been born six years before her present illness, and there was a history of one — perhaps somewhat doubtful — miscarriage four years before the present illness. The case was one, it will be seen at once, in which a diagnosis of extra-uterine pregnancy was easily made. There had been attacks of pain and slight faintness for a fortnight before the actual rupture; there was a history of two months' absolute amenorrhœa, no hæmorrhage from the vagina occurring till the morning of the day on which I saw the patient, and the quantity lost by the vagina was trivial. There was, on the other hand, the fact that when I saw the patient she was evidently extremely ill; the slight disturbance involved in moving her round from the head to the foot of the bed was sufficient to cause her almost to faint away, and to temporarily stop the pulse. She was markedly anæmic and there had been no loss of blood from the vagina that could for a moment be supposed to have caused the state of anæmia that was actually present. There was extreme tenderness about the lower abdomen. I have observed this in some other similar cases, and it appears to me to be a symptom of considerable significance. The enlargement of the uterus and the presence of some indistinct swelling to the right of it, as well as the active condition of the breasts, completed the evidence on which the diagnosis followed. At the same time, although one arrived at the diagnosis of ruptured extra-uterine pregnancy, the question of operative interference was still one that seemed to require a little deliberation. Undoubtedly in a certain proportion of cases, expectant treatment has been followed by the recovery of the patient. It is generally recognised that a large proportion of cases known as pelvic hæmatocele are really due to ruptured tubal pregnancy, and it is also well known that the large majority of cases in which a diagnosis of pelvic hæmatocele only was arrived at in former years used ultimately to recover without any operative treatment, from which it would seem to logically follow that operative treatment in tubal pregnancy is rarely, if ever, necessary, which at the present day may be regarded as a *reductio ad absurdum*. The truth probably is that a large proportion of the cases in which operative treatment is now undertaken, in former days died either directly from hæmorrhage or secondarily from peritonitis in circumstances in which no satisfactory examination likely to discover the cause of death could be obtained. No doubt many of them died at home, and the natural objection of the friends to any post-mortem examination led to the cause of death in many cases remaining a matter of conjecture. The less serious cases were those that ultimately came under observation, and were clinically grouped as cases of pelvic hæmatocele; and there is no doubt at all that the larger proportion of such cases do ultimately get well without interference. I have myself seen a great many such. The present case that I have just recorded seems to me an instance in point. If the friends had refused to allow of an operation or to allow of her being removed to the hospital

the probability—in my mind amounting to certainty—is that she would have died, and died at home; and if the friends had objected to allow an examination of the body, it would have been open to them to do so and the true nature of the case must have remained doubtful. When I saw her in the first instance, having arrived at the diagnosis of ruptured tubal pregnancy, I thought it extremely likely that abdominal section would be necessary; but I waited for about six hours with a view to testing whether the anæmia was, so to speak, progressive. The delay was, from the point of view of deciding as to operation, of considerable value, because there could be no question at all that her condition was very much more serious at 9 o'clock than it was at half-past three. This was shown by the increased frequency and diminished volume of the pulse. Another point of some interest in the case is the fact that an intra-peritoneal hæmorrhage due to rupture of the tube was produced by a tubal mole—that is to say, by an ovum situated in the tube degenerated into a mole which might *a priori* naturally be considered to be in a stationary or indeed retrogressive condition; but the case shows clearly that the death of the ovum and its degeneration into a mole are not necessarily followed by a condition of safety to the patient. There can be no doubt that the degeneration of the ovum into a mole was a condition that had existed for, relatively, a considerable time, perhaps two or three or more weeks, and with the death of the ovum it might have been expected after that period that no further danger would arise; yet, in fact, the rupture of the tube and serious intra-peritoneal hæmorrhage as above mentioned occurred. The condition of the opposite tube was one of some interest, as it was considerably dilated, its fimbriated extremity occluded, and it contained a firm brick-red clot. The wall of the tube on that side was very thin; the corpus luteum in the right ovary, although perfectly distinct, was of a fairly homogeneous appearance, and did not show the well-known convoluted margin. As regards the actual operation, the complete cleansing of the peritoneum from blood and clot by repeated washing is no doubt an important point to attend to, and, for my part, owing to the great difficulty, no matter how carefully the washing is done, of really getting away every fragment of clot, I think it is desirable to use a Keith's drainage-tube in cases of this class. In the cases that have come under my observation the convalescence has been much more rapid when a Keith's tube has been used than when the abdomen has been closed without drainage.

The general history of the case, the actual condition of the uterus as seen at the operation, the corpus luteum in the ovary, and the condition of the right Fallopian tube on inspection, make the diagnosis of tubal pregnancy practically certain; but it is no doubt always desirable when the fœtus is not discovered to examine portions of the contents of the tube under the microscope for chorionic villi. In the present case sections of the mass in the tube showed chorionic villi in abundance.

Harley-street, W.

ANTERIOR COLPOTOMY AND VAGINAL FIXATION.

BY WILLIAM J. GOW, M.D. LOND.,

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ANTERIOR colpotomy, or the method of reaching the peritoneal cavity through an incision made in the upper part of the anterior vaginal vault, is performed with one of three objects in view: (1) As a means of exploring the condition of the ovaries and tubes in certain cases where their condition is doubtful; (2) for the purpose of removing the uterine appendages on one or both sides, provided that the diseased appendages are not greatly enlarged or very firmly adherent; and (3) for the purpose of overcoming retroversion and retroflexion by means of vaginal fixation. The incision, which may be either transverse or longitudinal, gives great scope for the exploration of the pelvic organs, as not only can the finger be introduced through the opening made and the parts be thus carefully mapped out, but by making traction on the uterine body with volsella forceps the uterus, tubes, and ovaries can generally without difficulty be drawn outside the vulva. The slighter degrees of salpingitis can thus be recognised, and if the abdominal ostia are closed an excellent opportunity is offered for the formation of an artificial opening. The ovaries, also, can be thoroughly examined and unsuspected adhesions can be diagnosed and broken down by the finger. Through this incision it is possible to remove the ovaries and tubes, but when it is deemed necessary to extirpate the appendages on account of severe inflammatory disease I believe that the abdominal route is the safest and best, and it is unwise for anyone to attempt the removal of an enlarged and adherent tube by this method unless in case of failure he is prepared to carry out the operation to its completion by abdominal section. In cases of bilateral tubal disease where the ovaries and tubes are enlarged to the size of an orange, abdominal section is by far the most satisfactory method for their removal, but in certain cases where the ovary on one side is enlarged to two or three times its natural size, lies low down and is markedly tender, besides being the seat of much pain, if its removal is decided on the vaginal route may be chosen with advantage. Not only is it easy to remove an ovary under such circumstances, but the absence of an abdominal scar is a matter not to be lightly passed over. No one can lay down any absolute rule as to when it is possible and when it is not possible to remove inflamed appendages by this method, because the factors concerned are not merely the size and adherence of the ovaries and tubes to be removed, but also the capaciousness of the vagina. Thus in a multipara it would be possible to remove a closely adherent appendage, whilst in a nullipara such a feat would be very difficult or altogether impossible. Speaking generally, however, if there is much matting of the parts and a history of recent pelvic inflammation, the abdominal route is much the safest and surest line of attack.

Among the thirteen cases in which I have performed anterior colpotomy the operation was once undertaken for the purpose of exploration and once for the removal of a tender and painful ovary, but in the remaining eleven cases vaginal fixation was performed, although in several instances one of the appendages was removed before the uterus was made fast to the anterior vaginal wall. On the merits of vaginal fixation I am not prepared to speak definitely because it is an operation which in this country at least has not been performed sufficiently often to admit of any very dogmatic statement being made. Some of my patients, however, have been so remarkably improved by the operation that I cannot help feeling that in certain cases it will hold its ground. The vast proportion of women in whom the uterus is retroverted and retroflexed present few or no symptoms, and of course for such cases the operation is quite unsuitable. In others where combined with the retroflexion there is considerable descent and an accompanying bearing down sensation some form of pessary gives relief. The class of case in which I have obtained the best results from vaginal fixation is the following. Young married women are not infrequently met with who present themselves for treatment on account of dyspareunia. The vagina is often short, and the uterus is found to be in a position of retroflexion with the fundus lying in Douglas's pouch. On making pressure with the examining finger on the fundus uteri great pain is complained of, and owing to the shortness of the vagina and the tenderness of the uterine body no form of pessary can be borne. In Case 4 these symptoms, together with severe dysmenorrhœa, were complained of. The dyspareunia was so great that it completely prevented coitus, and the patient was consequently greatly depressed, and there was considerable impairment of her general health. Anterior colpotomy followed by vaginal fixation was performed, and the patient about five weeks later came back to the hospital in the best of spirits and stated that she was completely cured of her dyspareunia and that she had just completed a menstrual period which for the first time in her life had been unaccompanied by pain. It is important to add that in no other case in which dysmenorrhœa was present have I observed any improvement in this condition follow on vaginal fixation. A case such as this forbids one to dismiss the operation of vaginal fixation as altogether worthless. The only thing that was done was to convert a retroflected uterus into a slightly anteflexed one, but by so doing it prevented any pressure being exerted on the uterine body during coitus and so cured the dyspareunia. In the class of case above described it is quite common to find evidence of tubal and ovarian inflammation, and the anterior

colpotomy permits not only of the diagnosis of this condition, which may have been too slight to give rise to recognisable physical signs, but also of treatment. It seems probable that in many of such cases the retroversion and retroflexion are the result of endometritis and salpingitis probably of a gonorrhœal origin, and that, therefore, the best interests of the patient are consulted by first thoroughly scraping out the interior of the uterus with a curette and then at once proceeding to perform anterior colpotomy, dealing with appendages as may seem desirable when they are exposed to view, and ending up by performing vaginal fixation and so overcoming the backward displacement.

In those cases in which curettage and removal of one of the ovaries are performed at the same time as the vaginal fixation it is not easy to apportion to the vaginal fixation its share in the improvement manifested. In five cases in which vaginal fixation was the only operation done three were considerably benefited for a time and two expressed themselves as cured when last seen. Of these two, one was the patient whose case is narrated above and the other was a patient who had complained of very similar symptoms. Even if it is necessary to remove one of the appendages and to curette the uterus vaginal fixation seems to be of use. It does away with the necessity for subsequently wearing a pessary and relieves the patient of the bearing-down sensations from which she formerly suffered. If proper care is taken it may be regarded as a procedure practically free from risk—at least, the risk is no greater than that of simple curettage—and in all the cases in which I have operated the uterus has remained permanently fixed in the position of moderate anteversion and anteflexion. The main objection that has been raised to the operation is that in case of subsequent pregnancy difficulties may arise during the course of labour and these may in some cases be so great as to necessitate Cæsarean section. This is due to the fact that if the fundus is firmly fixed to the cellular tissue in the space of Retzius it is unable to rise up as pregnancy advances, and so the uterus enlarges at the expense of the posterior uterine wall, which is thus greatly stretched. Miscarriage is also apt to occur under these circumstances.

It seems probable that dangers such as these may be completely avoided by taking care not to insert the sutures too high in the anterior uterine wall so that the fundus is not dragged down and fixed. In none of my cases have the patients become pregnant, so that from personal experience I am not in a position to express any opinion on this matter. Even if such difficulties do arise they appear to arise only in a small minority of the cases. The method of performing the operation which I have adopted is the following. The vulva is shaved and then thoroughly scrubbed with soap and water and sponged with an antiseptic solution. This is very necessary because when the uterus and ovaries are drawn outside they lie in close contact with the external parts of the patients. The vagina is then irrigated with a solution of perchloride of mercury and scrubbed over with cotton-wool sponges. A Sims' speculum is introduced and the cervix is seized with a volsellum. A transverse incision is made at the point where the vagina is reflected on to the cervix and the connective tissue space between the bladder and supra-vaginal cervix is opened up. By means of the finger or another Sims' speculum this tissue is rapidly torn through, but if the scissors are used it will usually be necessary to ligature one or two small arteries. If the blade of the speculum be now thrust deeply in so as to displace the bladder forwards the lower part of the anterior uterine wall can be seen clothed with peritoneum. The peritoneal reflection is caught up with a pair of pressure forceps and the peritoneal cavity laid open. The speculum which was holding the bladder forwards is now withdrawn and the finger is introduced and the appendages explored. If adhesions are present these may be broken down, and when sufficiently freed the next procedure is to draw the retroflected uterus out through the aperture which has been made. To do this a volsellum is fixed into the anterior surface of the uterus at the level of the os internum and slight traction is then made. Another volsellum is then fixed at a point half an inch higher up and the first one detached. By alternate application and detachment it is possible to thus gradually climb up the uterus until a volsellum is finally fixed into the fundus, and when this is pulled on the uterus, followed by the ovaries and tubes, emerges through the opening into the vagina and so out at the vulva. Whilst the volsella are being applied care must be taken that the bowel, which sometimes protrudes slightly, is not injured. The parts thus drawn out are thoroughly explored, and if necessary an ovary or tube is removed or salpingostomy performed. The appendages are then pushed back into the abdominal cavity. A needle on a handle, armed with a moderately stout silk thread, is then thrust deeply into the anterior uterine wall to one side of the middle line at a point about half an inch below the level of the insertion of the tubes and made to emerge just above the level of the os internum. The thread is drawn through, and a similar proceeding is carried out on the opposite side of the middle line. We have now the uterine body projecting through the opening in the vaginal vault with two threads passed side by side from above downwards in its anterior face. The uterus is sponged free from blood and returned into the abdominal cavity. The upper end of one of the ligatures is again threaded on the needle before used and made to penetrate the raw surface of the anterior vaginal wall and brought out about a quarter of an inch from the free edge. The lower end of the same ligature is then threaded and the needle is thrust into the tissues of the anterior surface of the supra-vaginal cervix. The other ligature is dealt with in the same way and the ligatures are then tied and the ends cut off short. The knots thus formed are concealed beneath the free edge of the anterior vaginal wall. No other sutures are necessary and it will now be found that the uterus has assumed a position of moderate anteversion and anteflexion. The vagina is sponged out, the volsellum is removed from the vaginal cervix, and a long strip of iodoform gauze is introduced. This is removed at the end of five days and the patient is allowed to get up on the eighth day and return home on the fourteenth. Properly prepared cotton-wool sponges are used throughout the operation.

In most cases the operation is an easy one, but occasionally difficulties do arise, and these are especially apt to be met with in cases where the operation is performed on patients who are either nulliparous or virginal, because under these circumstances the narrowness of the vagina prevents a free opening being made into the peritoneal cavity. The first difficulty met with may be when an attempt is made to open the peritoneal pouch passing from the uterus to the bladder, a procedure which is generally quite easy, but sometimes causes temporary delay; care must be taken at this point that the bladder be not opened by mistake. The next difficulty is in extracting the uterus. If adhesions are present they must first be broken down, but if the uterus is bulky or its walls unnaturally friable there may be, even if there are no adhesions, considerable trouble in drawing it through the opening in the vaginal vault. In nulliparæ, where it is not possible to make a very wide opening, this difficulty is most likely to occur, but by patience it can be overcome. To avoid tearing away portions of the anterior uterine wall the volsellum should be made to grasp as much of the uterine tissue as possible, and if necessary a second pair should be applied by the side of the first so as to distribute the traction over as wide a surface as possible. As regards the dangers of the operation I would simply point out that if rigid antiseptic precautions are taken there is no risk whatever; but if such precautions are not taken or are inadequate then serious complications may ensue. A brief account of the thirteen cases is here appended.

CASE 1.—A woman aged twenty-eight years was admitted to St. Mary's Hospital on Aug. 12th, 1895. She had been married six years and had three children, the last born three years ago. She complained of constant pain in the sacrum and left iliac fossa, which had been sufficiently severe for the last five months to prevent her attending to her household duties. She had had similar pains from time to time during the past four years. A pessary at one time gave her relief, but at the present time only aggravated her pain. The menstrual flow was not excessive, but had always been attended with pain. The uterus was found in the position of retroversion and much pain was caused by pressing on the fundus. Nothing further abnormal was discovered. After three weeks' rest in bed no improvement was obtained and therefore an operation was advised. An anterior colpotomy was performed on Sept. 5th. The appendages were found to be healthy. The uterus was drawn out and fixed to the anterior vaginal wall. Some recurrent hæmorrhage occurred a few hours after the operation, but was easily checked by packing the vagina more firmly. Convalescence was normal. Within three days of the operation the patient declared that the continuous sacral pain had quite disappeared, and when she left the hospital she stated that she felt quite well. This

patient was last heard of in April, 1896, and there then appeared to be some return of the backache, but not so severe as before.

CASE 2.—A woman aged twenty-four years, admitted to the Royal Hospital for Women and Children on Sept. 25th, 1895. She had been married three years and had never been pregnant. Ever since her marriage the patient had suffered from pain in the left iliac fossa, which had been gradually getting worse and worse. Pain was also felt in the hypogastrium and lower part of the back and came on both when lying down and walking about. It was very severe in character and prevented her from attending to her housework. Menstruation was regular and not unduly profuse, but was attended by some pain during the first day of the flow. The patient first presented herself for treatment early in June, 1895, and on examination at that time nothing abnormal could be discovered; the uterus was directed forwards and the appendages appeared healthy. Medicine quite failed to relieve her and she was admitted after three and a half months' treatment with a view to exploration of the pelvic organs. An operation was performed on Sept. 27th, 1895. The uterus was dilated and curetted. Anterior colpotomy was then performed. The tubes were not markedly thickened, but numerous adhesions were found around the ovaries. These were partially broken down by the finger, but it was not possible to draw the ovaries outside. The wound was then closed. For several months after the operation the patient had no pain, but since that period there has been some recurrence of pain at the menstrual periods, but the intermenstrual pain, though occasionally felt, is much less severe than before the operation.

CASE 3.—A woman aged thirty-two years, admitted to the Royal Hospital for Women and Children on Oct. 30th, 1895. She had been married nine years and had one child eight years ago, stillborn. Three weeks after delivery she caught cold and was laid up for several weeks with "inflammation of the womb." Menstruation was regular before her first pregnancy, the flow lasting three days. Since the birth of the child the periods have never been regular, there being three to four months' amenorrhœa, followed by a profuse loss of blood. Nothing has ever been passed to suggest that this was the result of periodic miscarriages. She had had pain in the left iliac fossa since the birth of the child, and two years ago a pessary was inserted, but proved so uncomfortable that it had to be removed. The patient menstruated last March, and then there was no further loss of blood for four and a half months, when profuse bleeding began and lasted seven weeks. After six weeks' intermission the bleeding recurred and had lasted up to the present time. She was a well-nourished woman, but rather anæmic, and complained of pain in the lower part of the back and in the left iliac region. On vaginal examination it was found that the cervix lay low down and the body of the uterus was retroverted and retroflexed and somewhat enlarged. An ovary the size of a walnut lay in Douglas's pouch. Operation was performed on Nov. 1st, 1895. The uterus was dilated and curetted and swabbed out with iodised phenol. Anterior colpotomy was performed. The enlarged left ovary which lay in Douglas's pouch was removed. The uterus was stitched to the vaginal wall. Owing to the vulva not having been shaved there was some suppuration around one of the sutures, and a small quantity of pus was discharged per vaginam. She, however, made an easy recovery and left the hospital three weeks later. The patient was seen in January, 1896, and reported that the pain in the left iliac fossa was much better and that there had been no further hæmorrhage. The pain in the back persisted. In April, however, she again reported herself and then stated that there had been some recurrence of the bleeding.

CASE 4.—A woman aged twenty-two years, admitted into the Royal Hospital for Women and Children on Dec. 4th, 1895. She had been married two years and had never been pregnant. She had always had severe dysmenorrhœa, but this had been worse since marriage. There had been serious dyspareunia ever since her marriage, sufficient to almost completely prevent coitus. For the last few months she had complained of bearing-down pain and pain in the left iliac fossa, and she had become depressed and weak. The patient was markedly anæmic, and on internal examination it was found that the vagina was short and the uterus low down in a position of retroversion and retroflexion. Great pain was complained of when the body of the uterus was pressed on by the examining finger, but there was no tenderness about the vaginal orifice. Anterior colpotomy was performed on Dec. 10th. The uterus and appendages were drawn outside. The ovaries and tubes were healthy. Some adhesions which existed in Douglas's pouch were broken down and vaginal fixation performed. She made an uneventful recovery and left the hospital on Dec. 24th. She was seen a month later and then stated that she was quite well. She had lost all her dyspareunia and also the pain in the iliac fossæ and the bearing-down pain, and in addition told us that her last menstrual period had been painless.

CASE 5.—A woman aged twenty-six years, admitted to the Royal Hospital for Women and Children on Dec. 12th, 1895. She had been married six years and had four children, the last thirteen months ago. The patient had never been well since the birth of her first child four years ago, but she had been much worse since her last confinement. Menstruation was regular and not unduly profuse. Her chief complaint was pain in the left iliac fossa, which was so intense as to prevent her doing her own housework. The uterus was found low down in the position of retroversion and retroflexion. A ring pessary had been tried, but it only gave her very slight relief. Anterior colpotomy was performed on Dec. 17th. The ovaries and tubes were inspected and found to be healthy. Vaginal fixation was performed. Convalescence was normal and the patient left the hospital on Dec. 30th. When last seen she expressed herself as very much better.

CASE 6.—A woman aged forty-three years, admitted to the Metropolitan Hospital on Dec. 30th, 1895. She had been married nineteen years and had six children, the last one born three years ago. She had not been pregnant since then. She stated that during the first five months after her confinement she had a continuous loss of blood, requiring her to use four or five diapers a day. For the last two and a half years she had suffered from metrorrhagia, the loss lasting several weeks with only a few days intermission. She complained also of constant pelvic pain. The patient was a thin, poorly nourished woman who had been attending in the out-patient department for many months without deriving any benefit. On vaginal examination the uterus was found to be bulky and to be lying in a position of retroversion and retroflexion. It could be partially pushed up, but she could not wear a pessary on account of the pain. Anterior colpotomy was performed on Jan. 5th, 1896. The tubes were healthy; the right ovary, which was enlarged from the presence of cysts, was removed. Vaginal fixation was performed. Convalescence was normal. Since the operation the menorrhagia has greatly improved and the pain complained of is less severe.

CASE 7.—This was a woman aged twenty-six years. She had never been well since the birth of her child six years ago. She complained of excessive menstrual loss, the flow lasting from seven to ten days. There was much pain before, during, and after the flow, chiefly in the right iliac fossa and back. She was only free from pain for about one week in every month. The uterus was found to be slightly enlarged and directed backwards and to the right. There was tenderness on pressure in the right posterior quarter of the pelvis. The patient first came under observation in November, 1895. Operation was performed on Feb. 1st, 1896, at a Nursing Home. The uterus was dilated and curetted. Anterior colpotomy was performed. The right ovary, which had some adhesions around it, was removed. Vaginal fixation of the uterus was done. Convalescence was perfectly normal. In April the patient reported herself as free from pain and excessive menstrual loss and stated that she could take long walks.

CASE 8.—A woman aged thirty-six years, admitted to the Royal Hospital for Women and Children on Feb. 25th, 1896. The patient had had four children and one miscarriage; the last child was born four years ago. She complained of nearly constant pain in the left iliac fossa, which was increased by standing or walking about. The pain was noticed after the birth of her first child, but had gradually grown worse. She had worn a pessary with slight relief. Menstruation was regular and not unduly profuse. She was first seen on June 27th, 1895. The uterus was found to be directed forwards and not enlarged; the left ovary was slightly larger and much more tender than the right. Anterior colpotomy was performed on Feb. 28th. The left ovary was removed and the wound stitched up. The patient was last heard of in May, 1896, and stated that she was greatly improved.

CASE 9.—A woman aged thirty-three years, admitted to the Metropolitan Hospital on March 18th, 1896. The patient was single and complained of constant pain in the sacrum

and iliac fossæ which she had had for several years. The pain was of a dull character and increased by exertion. It was most severe for the week preceding the menstrual loss. She was unable to follow her occupation. The uterus was found to be retroverted and retroflexed, the fundus being directed somewhat to the right side. A good deal of tenderness was complained of when pressure was made on the uterus. Anterior colpotomy was performed on March 21st. The uterus was drawn out with some difficulty because of the narrowness of the vagina. Vaginal fixation was performed. Neither of the ovaries were removed. Convalescence was normal. The patient was last seen on May 27th, 1896, and then stated that the pain in her back was much improved, but that the pain in the iliac fossæ was the same as before.

CASE 10.—A woman aged twenty-seven years, admitted to St. Mary's Hospital on March 24th, 1896. The patient had suffered for several years from constant pain in both iliac fossæ, which was sufficiently severe to prevent her following her employment. Menstruation was regular and not unduly profuse, but was attended with much pain. The woman had attended at many hospitals, but had failed to obtain any relief. Rest in bed gave no relief. The uterus was found in a position of retroversion and retroflexion, and both ovaries lay low down by the side of the fundus and were exceedingly tender. Anterior colpotomy was performed on April 7th. The uterus and appendages were drawn out. There were no adhesions and the Fallopian tubes appeared healthy. The ovaries were not enlarged, but the capsules of both of them were markedly thickened. Neither of the ovaries were removed. The uterus was fixed to the anterior vaginal wall. Convalescence was normal. Six weeks later she stated that the intermenstrual pain was much less constant and less severe, but at her last monthly period she experienced her usual dysmenorrhœa.

CASE 11.—A woman aged twenty-seven years, admitted to the Royal Hospital for Women and Children on March 31st, 1896. She had been married three years and had never been pregnant. Two months after marriage she had sores about the vulva followed by a suppurating bubo in the groin. Menstruation was regular before marriage, the duration of the flow being two or three days. Since marriage the loss had been more frequent and more profuse, lasting about eight days. She complained of pain in the back and dyspareunia. The uterus was found to be in the position of retroversion and retroflexion, the fundus lying low down in Douglas's pouch. The uterus could be pushed up far, and much pain was caused by the attempt. Operation was performed on April 4th. The uterus was dilated and curetted and swabbed with iodised phenol. Anterior colpotomy was done. The uterus and appendages were drawn outside. Both tubes were slightly enlarged, the left more so than the right. The abdominal ostia were both sealed up; the left tube was removed. Except for a few adhesions the ovaries appeared healthy. The uterus was fixed to the anterior vaginal wall. The patient made a normal recovery. When seen a month later she stated that she had lost all her dyspareunia and that she felt much better and was free from pain.

CASE 12.—A woman aged twenty-eight years, admitted to the Royal Hospital for Women and Children on May 11th, 1896. She had been married eight years and had two children, the youngest being six years old. She had had no miscarriages. The patient had had dragging pain in the left iliac fossa for several years. The pain was nearly constant and she had failed to obtain any relief from it although she had attended numerous hospitals both as an out- and in-patient. She had worn a pessary on account of prolapse of the womb. Menstruation was regular and not excessive. On vaginal examination it was found that the uterus was retroverted and retroflexed, the fundus, which was not enlarged, lying in Douglas's pouch. In the left posterior quarter of the pelvis was a rounded, not tender, elastic swelling the size of a bantam's egg; it was fixed. The ovary on the right side could be felt, but it was not markedly enlarged. Anterior colpotomy was performed on May 12th. The adherent swelling on the left side was found to be the left ovary. The adhesions were broken down and the ovary and corresponding tube were removed. The enlargement was due to the presence of several cystic cavities which contained blood. The right ovary was healthy, but the abdominal ostium of the right tube was sealed up and a small quantity of serous fluid was contained in the interior. Salpingostomy was performed. The right tube and ovary were returned into the abdominal cavity. The uterus was fixed to the vaginal wall. Convalescence was normal. When the patient was last seen she had lost the pain in the left iliac fossa and felt, as she expressed it, quite a different woman.

CASE 13.—A woman aged twenty-eight years, admitted to the Metropolitan Hospital on May 10th, 1896. She had been married twelve years and had one child, eleven years ago. She stated that since her confinement she had always had severe dyspareunia and pain in the left iliac fossa. Menstruation was regular, but rather profuse, and attended by pain during the first day. The uterus was in a position of retroversion and retroflexion, the fundus lying in Douglas's pouch. There was marked tenderness on pressure and the fundus could only be pushed up a short distance. A ring pessary had been inserted, but this only increased her pains. Anterior colpotomy was performed on May 13th. When the finger was introduced into the pelvic cavity it was found that the uterus was fixed by old and dense adhesions and that the appendage on the left side was so matted to surrounding parts by similar adhesions that the ovary and tube could not be distinguished. It was found impossible to draw the uterus out into the vagina, but the fundus was drawn up out of Douglas's pouch and the anterior surface of the uterus fixed to the vagina. Convalescence was normal, but when the patient was last seen she stated that she had obtained no marked relief from the operation.

Weymouth-street, W.

WHY IS THE LEFT HEART STRONGER THAN THE RIGHT?

BY HARRY CAMPBELL, M.D., F.R.C.P. LOND.

THE above question practically amounts to this: why is the resistance in the systemic circuit greater than that in the pulmonary? No physiologist has, so far as I know, explained the fact. The first explanation which suggests itself, and that tacitly assumed by the text-books, has reference to the larger size and greater complexity of the systemic vascular area, this being some fourteen times greater and much more complex than the pulmonary. It is assumed that the systemic circuit, by virtue of its greater size, necessarily offers the greater resistance. This assumption is the very opposite of the truth. The relative smallness of the pulmonary circuit operates in the direction of increasing the resistance in it; every time a ventricle-ful of blood passes through the larger segment it has to traverse the smaller one; hence the circulation in the latter must be some fourteen times more rapid than in the former, and, seeing that friction increases with rate of flow, it is obvious that the relative smallness of the pulmonary segment tends to make pulmonary resistance greater than systemic resistance. We know from clinical experience that the destruction of pulmonary tissue, with the resulting shrinkage in vascular area, augments resistance and casts extra work upon the right heart; but in order to appreciate fully the fact that resistance tends to vary inversely with vascular capacity let us suppose the pulmonary segment to be made up of the systemic pulmonary vessels—i.e., the bronchial. Imagine in that case the enormous resistance it would oppose to the right heart, and the enormous force that would be required to drive through it, in a given time, the same quantity of blood as passes through the systemic segment! Under such circumstances the right heart would require to be some scores of times more powerful than the left.

How, then, are we to explain the circumstance that systemic resistance is nevertheless so much greater than pulmonary? In seeking the explanation we must keep in view a fact much overlooked by physiologists—viz., that the complexity of a system of tubes does not necessarily increase its resistance to the fluid circulating in it. Witness the small resistance which the liver opposes to the portal blood. Witness, again, the facility with which the blood passes from the systemic arteries into the veins directly marked arterial dilatation occurs. The fact is that a special resistance is opposed in each circuit for a special physiological purpose. Each requires a certain degree of peripheral resistance in order to ensure that stretching of the arteries which is essential to a continuous, as distinguished from a pulsatile, flow in the capillaries. This special resistance is

located on the arterial side of the systemic and pulmonary capillaries, the capillaries themselves, as I have elsewhere shown, offering a resistance so small as to be practically a negligeable quantity. Now, seeing that the systemic arteries oppose so much more resistance to the circulation than the pulmonary, it follows that some extra resistance must be situated in the former over and above that just referred to, for otherwise the pulmonary circuit would, as we have just seen, offer the greater resistance. What is the purpose of this extra resistance? The answer to this question explains why the left heart is so much more powerful than the right, and why the systemic arterial tension is so much greater than the pulmonary. The purpose is, I conceive, the adequate regulation of the systemic blood-supply to various regions of the body, in response to physiological demands. The pulmonary segment needs no such local modifications in blood-supply. The pulmonary arteries are undoubtedly under the control of a vaso-motor system, but this probably acts simultaneously upon the entire system of pulmonary arteries so as to facilitate or obstruct the flow throughout the whole arterial expanse. In the case of the systemic segment, on the other hand, the quantity of blood passing through the various vascular areas requires to be regulated with great nicety, a given area requiring now much, now little blood; and such local modifications in blood-supply imply, it would seem, a high mean systemic resistance. To make this point clear let us imagine a systemic circuit in which the arterial resistance is no greater than the venous. It would under such circumstances be quite impossible to vary the blood-supply to a large area within wide limits. In order, for example, to curtail the supply of blood to such an area, the arteries supplying it would require to be considerably constricted, and such widespread constriction would imply considerable resistance. But, it may be asked, would it necessarily imply a large increase in the total arterial resistance? Would it not be possible, by a marked vaso-motor dilatation of the non-constricted area, to completely counteract the effect of the vaso-constriction on resistance, so that the total arterial resistance should remain at its original low level? This might, indeed, be possible, but it would manifestly lead to an excessive flushing of the dilated area with blood. On the other hand, it would be equally impracticable, in our hypothetical system, greatly to augment the blood-supply to any area; for the absence of decided resistance implies low arterial pressure, and under these circumstances vaso-motor dilatation of a vascular area, say the renal, would not produce the necessary augmentation of blood-supply to it, or the needful increase of capillary blood pressure. With considerable resistance, however, and the resulting high arterial tension, the blood-supply to any area, and the capillary blood pressure in it, can at once be greatly augmented.

Hence we arrive at the remarkable conclusion that the left heart is stronger than the right heart, not because the systemic circuit is more capacious or more complex than the pulmonary, but because the systemic blood-supply to various parts of the body requires to be constantly modified within wide limits, while such local modifications are, in the case of the pulmonary system, quite unnecessary.

Devonshire-street, W.

PERIPHERAL NEURITIS FROM TOBACCO.

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IT is now a well-established fact that impaired vision often results from tobacco smoking. The defect occupies the centre of the field of vision, extending from the fixing point to the blind spot, and is most marked for colours, especially for red and green. The scotomata are more or less symmetrical and, as a rule, unaccompanied by any peripheral limitation of the fields. The defective area corresponds to that portion of the retina which is supplied by the papillo-macular bundle of the optic nerve fibres. At an early stage of the affection the discs are often slightly swollen and hazy, while at a later period in bad cases they show a slight or moderate degree of atrophy. Most observers believe that the condition depends on an interstitial inflammation of the axial portion of the optic nerve, the mischief starting in the disc or immediately behind it. If this be the case—namely, that tobacco leads to neuritis of the peripheral parts of the optic nerves—the question naturally arises, Does tobacco ever attack other nerves? Because, judging from the effect of many poisons on the nervous system, we might naturally expect that, in some cases at any rate, the effect of tobacco would not be limited to one nerve—the optic nerve—but would show itself by disturbance of the functions of other nerves, such as the peripheral spinal nerve. It is, therefore, somewhat remarkable to find that such a possibility is not even mentioned by writers on the subject of tobacco poisoning or on that of tobacco amblyopia. Curiously enough the converse problem has been discussed with regard to alcohol. Thus while the production of multiple peripheral neuritis from alcohol is a well-ascertained fact in pathology the question of amblyopia from alcohol, although not yet completely settled, has been carefully investigated and discussed.

That different poisons (which persumably circulate freely in the blood) present considerable differences as regards the nerves attacked, is well known; thus lead shows a preference for certain branches of the musculo-spiral nerve and the poison of diphtheria for the nerves of the palate, whilst that of syphilis affects mainly the cranial nerves and only quite exceptionally attacks the peripheral parts of the spinal nerves. Hence it is not very astonishing that another poison—namely, tobacco—also shows a selective action, picking out the optic in preference to any other nerves. But other poisons, while exhibiting individual preferences for certain nerves, frequently attack many nerves. Is this the case, even if only very rarely, with regard to tobacco? For several years I have been looking out for cases of peripheral neuritis from tobacco poisoning, and I believe that they do occur although undoubtedly with great rarity. The following case is the most satisfactory example that has come under observation.

A man aged thirty-seven years consulted me in January, 1893. He stated that for two months he had suffered from numbness and tingling in the fingers and toes, that they were always very cold and dead, and that he could not use his hands properly. His sight also had been failing for several years. On examination the grasp was weak, that of the left hand especially so. All the movements of the left fingers were feebly performed and he was unable to oppose the point of the left thumb to the tip of the little finger without flexing the terminal phalanges. The interossei and the thenar and hypothenar eminences were slightly wasted. The movements at the wrists and of other parts of the upper limbs and of the lower limbs were not affected. The cutaneous sensibility of the hands was modified; thus he could not distinguish between the head and the point of a pin in many places. The knee-jerks were absent. On examining the eyes the following results were obtained: right vision $\frac{6}{36}$, not improved by glasses, J. 1; and left vision $\frac{6}{6}$, not improved by glasses, J. 2. There was a large scotoma for green in the centre of both fields, and a small one for red in the centre of the left field. Both optic discs were very pale and appeared atrophic. The man had always been a very heavy smoker, his average quantity of tobacco being one ounce of twist daily, and two years previously Dr. Little told him that his dimness of sight was due to tobacco. Neither his appearance nor his history gave any evidence of a tendency to alcoholic excess. He had not had syphilis, rheumatism, or diphtheria, and no account could be obtained of exposure to the action of any other poison than tobacco. He was ordered to give up smoking entirely, and a month later all his symptoms were less pronounced, his sight had improved, and the strength and sensation of his hands were much better. A few weeks later he appeared to be quite well, but his knee-jerks were still absent.

In two other cases of tobacco amblyopia in which alcohol and other poisons could be excluded I found slight symptoms of peripheral neuritis, such as weakness of the special movements of the fingers together with numbness and tingling and slight anæsthesia.

I do not consider that the case related absolutely proves the dependence of peripheral neuritis on tobacco poisoning, but it raises the question as to such a connexion, which I trust may be investigated by ophthalmic surgeons and others who see a large number of cases of tobacco amblyopia, a condition which but rarely comes before the notice of the general physician.

Manchester.

A WRY-NECKED FAMILY.

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THE illustration represents two brothers and two sisters suffering from torticollis. The cases are numbered from left to right and arranged in order of severity. Each was born apparently healthy, but in after-life symptoms of torticollis developed. There is nothing in the family history that suggests any probable cause of the condition.

CASE 1.—The patient began to walk when she was three years of age. She had torticollis in childhood, but does not know the date of its commencement. When fourteen years of age she had chorea, but there is no history of rheumatism. After this date the torticollis became more marked. As regards her present condition there is well-marked torticollis. The right shoulder is pulled up. There are tonic contractions of all the muscles of the left side of the neck and frequent jerking contractions of the erector spinæ than on the corresponding side. There is no paralysis or loss of sensation. His general condition is good.

CASE 3.—The patient's general health has always been good. About ten weeks ago he noticed a sensation of "pulling" in the right side of his neck. This symptom rapidly increased in severity until his head was strongly pulled down towards his right shoulder, rotated to the left, and extended so that his face looked upwards and to the left. He now speaks very slowly, but says he has always done so. The right shoulder is slightly pulled up. The right sterno-cleido-mastoid, the upper border of the trapezius, and the levator anguli scapulæ are affected; these muscles are slightly hypertrophied. If the sterno-mastoid be taken between the finger and thumb slight but frequent tonic contractions can be felt.

CASE 4.—The patient is a healthy, good-looking girl eighteen years of age. She states that for a few months she has been troubled with involuntary movements of her head backwards and to the right. At first the movements were very slight and occurred at long intervals, but lately they had been stronger and more frequent, and now she notices that her head is slightly pulled to the left when she is thinking of something else, but she can always keep it straight by an effort of the will. The head is at present slightly rotated to

muscles. The muscles of the right side of the neck are hypertrophied and are much larger than those of the affected side. There are jerking choreiform movements of the muscles of the face and great difficulty in speaking and swallowing. The limbs are also markedly affected. When spoken to all the contractions become exaggerated. Slight movements occur during sleep. Otherwise the patient is in good general health.

CASE 2.—The patient in this case is a strong-looking man, thirty-six years of age. He never had anything the matter with him until four years ago, when he was troubled with twitching of the muscles of the face and running from the eyes; later he had pains in the muscles of his back and at times his head was jerked backwards. Six months after this he noticed that his head was pulled to one side. The contractions were worse in damp weather; at times he had a difficulty in speaking. At the present time the left shoulder is markedly pulled up, and the head is pulled backwards and rotated to the right. There are no convulsive movements, but if the affected sterno mastoid be taken between the finger and thumb slight tonic contractions can be felt. The sterno-mastoid and trapezius on the affected side are smaller the left and approximated to the right shoulder. On examining the neck the right sterno-mastoid is slightly more prominent than the corresponding one. There are no other symptoms of importance.

I have been unable to find any other account of torticollis affecting a family in the manner described above. Ross in his "Diseases of the Nervous System" states that "the relatives of those suffering from wry-neck are not unfrequently subject to hysteria and nervous affections." What the cause of this peculiar family affliction may be it is difficult to say. I think one may put out of consideration the possibility of coincidence. There is no evidence of there being any hereditary pre-disposition to the disease, but it is not impossible that heredity may have something to do with the condition. It is known that one child may by mimicry acquire choreiform movements from another affected with chorea, but it is difficult to conceive that torticollis would be acquired in the same way. However, the most important question is, Can anything be done to relieve this unfortunate family? So far as one can see very little can be done, and I will not venture to suggest any method of treatment.

Bolton.

NOTES IN THERAPEUTICS AND PHARMACY.

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I.—BORAX SOAP.

I AM persuaded that it would tend to the precision of the art of medicine and to the advancement of pharmacy, no less than to accuracy in the exhibition of our remedies and to better reliability of therapeutic information, if medicated soaps, which are now largely used by the profession in the treatment of affections of the skin as well as purchased and employed, often ignorantly, by the general public, were prescribed with precise directions to the compounder in our authoritative magistral formula. Surely in this matter, as in all cases of medicinal prescribing, the interests alike of the patient, of medicine, and of pharmacy are better served by the indication of remedies in magistral formulæ which are especially written for the treatment of each particular case of disease, more difficult and troublesome as such procedure may usually be, than by the "ordering" of ready-made and often proprietary compounds, which are not seldom of doubtful composition, and the recommendation of which degrades the important art of prescribing, and tends, in ways which will be readily appreciated, both to the professional deterioration of the physician and to the commercial disadvantage of the dispenser. The sapo durus of the British Pharmacopœia, which is a pure and neutral hard soap, furnishes an excellent basis for magistral medication by the addition of remedies designed for application to the skin, and prescribed according to the particular requirements of individual cases; the added drugs can be well incorporated with this basis secundum artem by a competent pharmacist. For example, in a case in which a soothing saponaceous detergent is desired, the following prescription may be given: sodii biboratis, 10 per cent.; saponis duri, 90 per cent.; olei rosæ, one minim to one ounce: misce, fiat sapo secundum artem. In some cases a weaker preparation may be used containing only 7½ per cent. or even 5 per cent. of borax. I have prescribed this application with much success, especially in the slighter cases of skin diseases affecting the face. I need not remind my professional brethren of the numerous therapeutic uses of borax as an external remedy. Dr. Lauder Brunton has given a good summary of them.[1]

II.—ARSENIC IN GASTRALGIA.

Further observation in practice has confirmed my favourable opinion of the curative efficacy of arsenic in the various painful neuroses included under the name gastralgia. I have already laid before the profession my earlier experience in this subject.[2] Romberg's well-known description of gastralgia is classical. He distinguished two forms of the malady—gastrodynia neuralgica, which he held to be hyperæsthesia of the gastric branches of the pneumogastric nerve, and neuralgia cœliaca, which he attributed to hyperæsthesia of the solar plexus. Clinical experience confirms the views of Niemeyer and of Henoch that this distinction is difficult and of doubtful utility in practice. Gastralgic affections, severe and slight, are rare in hospital practice, and frequent amongst private patients, especially in those of nervous temperament. I need scarcely observe that for obvious reasons the diagnosis of gastralgia is one which should neither be lightly made nor negligently maintained. But pain arising in the stomach when the organ is empty and relieved by the ingestion of food is almost diagnostic, as the late Dr. Wilson Fox taught,[3] of its nervous nature and origin. With due regard to the causal concomitants and antecedents of gastralgia arsenic cures the disease. It is best to give the drug in a pilular form. I exhibit a twenty-fourth of a grain of arsenious acid made into a pill with two or three grains of some tonic vegetable extract, such as gentian, three times daily half-way between meals. Scarcely any other medicinal treatment is needed in cases of moderate severity and the use of the remedy should be continued for some weeks. In severer cases I use counter-irritation to the epigastrium of duly proportioned activity. I have usually found a full and varied dietary suit gastralgic patients far better than a restricted "dyspeptic" regimen. It is in such cases that Trousseau's maxim is so true—that we should know what a patient does eat before we advise him upon what he may feed.

[1] Text-book of Pharmacology, Therapeutics, &c.
[2] THE LANCET, Aug. 13th, 1887, and Contributions to Practical Medicine, 1891.
[3] Reynolds's System of Medicine.

III.—GLYCERINE IN CERTAIN AFFECTIONS OF THE STOMACH.

Some years ago Dr. Sydney Ringer recommended, I think in one of the medical periodicals, the administration of glycerine by the mouth in certain affections of the stomach. I regret a reference to his paper is not near my hand. Acting upon his suggestion I have since treated many cases of painful gastric digestion, such as are usually attributed to sub-acute or chronic catarrh of the gastric mucous membrane, with glycerine with satisfactory results. So far as I have seen this employment of glycerine is not widely extended in professional practice, nor have I noticed further reference to it in our periodicals. The familiar routine seems to be a ringing of changes upon bismuth, alkalies, acids, and digestives. Many cases of gastric maladies of the kind I have indicated yield to glycerine; I give one drachm, a drachm and a half, and sometimes even two drachms, with a little of some simple bitter stomachic tincture, diluted to an ounce with water, thrice daily between meals.

Birmingham.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

ST. GEORGE'S HOSPITAL.

A CASE OF PANCREATIC CYST AND ONE OF RETRO-PERITONEAL SANGUINEOUS CYST, BOTH TREATED BY OPERATION; REMARKS.

(Under the care of Mr. G. R. TURNER.)

CASE 1 is a typical instance of pancreatic cyst occurring in a man; it was of somewhat rapid formation and associated with considerable gastro-intestinal symptoms. The pain was apparently rather less than usual and there was no history of injury. As a rule the treatment which Mr. Turner adopted is found to be most successful, and has yielded better results than any other method. Occasionally posterior drainage has also been employed, when all the discharge comes through one opening and is continued for a long time, the skin around becomes much irritated, and in one recorded instance epithelioma of the opening developed. There are now many instances of this disease on record—Julius Schnitzler of Vienna gives a list of forty cases (including the thirty-six given by Dr. Hessche)—and it is much more commonly diagnosed before operation, as a description of it occupies a place in most of our new text-books. In regard to Case 2 we would refer our readers to the remarks by Mr. Turner, as they convey full information on the interesting group of cases of which this is an example.

CASE 1. *Pancreatic cyst successfully treated by laparotomy.*—A man aged thirty-four years was admitted into St. George's Hospital on Jan. 13th, 1894, with the following history. Except for occasional biliousness and sick headache he had always enjoyed good health. In April, 1893, after his dinner he was suddenly seized with violent abdominal pain. This was followed by vomiting, constipation, and distension. He was in bed for nine days with symptoms resembling obstruction of the bowels. A week afterwards he had a relapse. Vomiting, abdominal distension, and constipation lasted on this occasion for seven days. There was no jaundice nor did he ever pass a gall-stone. Since this he had had a good many similar attacks varying in severity. In May, 1893, an abdominal swelling about the size of a hen's egg and said by

his attendant physician not to be connected with the liver was first noticed. This swelling the patient stated had varied in size, and in the autumn of 1893, when he was away for his holiday, had nearly disappeared. In October, 1893, he had another bad attack of vomiting and constipation with abdominal distension. The tumour was now again easily felt and had continued to increase in size until about three weeks before his admission into the hospital. On admission there was a prominent, fluctuating, obviously cystic swelling occupying the epigastric, and extending into the left hypochondriac, and upper part of the umbilical, region. Liver dulness

FIG. 1 (CASE 1).

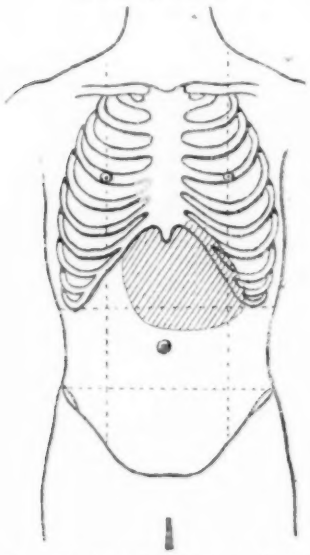


Diagram of area of dulness passing into that of liver and heart.

was, perhaps, separated from that caused by the tumour by a narrow interval of resonance, but this was difficult to determine. There were no enlarged superficial veins and the general health of the patient was in all other respects satisfactory. (Fig. 1.) It was decided at a consultation to make an exploratory abdominal incision and deal with the cyst as occasion demanded. An incision was accordingly made in the left linea semilunaris on Jan. 15th and the abdomen opened. The stomach and great omentum presented, but there was no appearance of cyst. Fluctuation, however, could be detected behind the stomach, and on an exploring needle being passed through the omentum an inch below the great curvature some dark-coloured fluid was withdrawn. The aspirator was then used to remove thirty-seven ounces of similar fluid. Care was taken that there should be no leakage into the peritoneum. The cyst was then opened sufficiently to admit the finger to examine the interior, which was smooth, except at the back, where there was felt a hardish mass. The latter was close on the vertebral column and was left undisturbed. It was evident that the stomach and omentum were adherent to the front of the cyst wall, the opening into which was stitched to the abdominal parietes and a drainage-tube inserted. The patient did well after the operation except that he on two occasions had attacks of violent abdominal pain and some sickness after food. There was never any peritonitis. The discharge had become purulent some fourteen days after the operation, after some inspissated secretion had escaped from the sac. The drainage-tube was removed a month after the operation, and he left the hospital with a very slight discharge of clear fluid (not sufficient in quantity to collect for analysis) from the sinus. The latter was not long in closing and the patient had remained well and had resumed his work when heard of two years after the operation. In January, 1896, he was in perfect health.

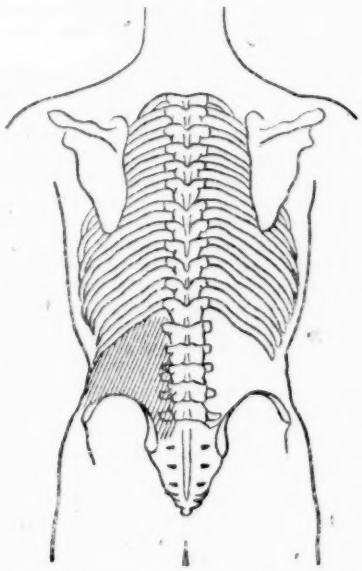
Examination of the fluid from the cyst by Dr. ARTHUR LATHAM.—The fluid was alkaline and had a specific gravity of 1014. Its colour, which was dark-brown or coffee-coloured, was probably due to the presence of methæmoglobin—that is to say, it gave the spectrum of methæmoglobin—and, like a solution of methæmoglobin, it yielded the spectrum of reduced hæmoglobin on the addition of a few drops of ammonium sulphide. No bile pigment was found. There was a large amount (half) of albumin present, and a portion of this albumin was of the nature of a globulin. When the albumin was removed the fluid was found to contain some albumose, but no peptone. Copper sulphate was readily reduced by the fluid, but this reduction was not due to the presence of sugar, as was shown by the phenyl-hydrazin test, nor was it due to the presence of uric acid, as was shown by the murexide test. The fluid gave the characteristic reaction for tyrosin with Millon's reagent, but yielded no satisfactory evidence of the presence of this substance when tested with sulphuric acid and neutral ferric chloride. No attempt was made to determine whether any ferment of the nature of pepsin or trypsin was present or not, because it was argued that the albumose in the fluid pointed to some digestion having already taken place, and, further, it was argued that as a large amount of unchanged albumin was present any experiment with fibrin, &c., would be fruitless. No milk-curdling ferment was found. Lastly, a large amount of chlorides was present. In the sediment no hooklets were to be seen, but there was a large number of yellow globular-like masses, which at first sight appeared to be of a fatty nature. They were not, however, sufficiently refractive; they did not stain with osmic acid nor did they dissolve in ether. It was then thought that these bodies might be leucin crystals in spite of the fact that they were not definitely like pure typical leucin crystals. Unfortunately, there is no good chemical test for leucin, though there are one or two physical ones. Of these latter perhaps the best is the fact that leucin sublimes on heating; and it was found that the sediment did so sublime, and, further, that it gave off a pungent odour (? amylamine). Thus, especially when the other constituents of the fluid were taken into account with reference to their possible action in obscuring the typical crystalline form of leucin, it seemed justifiable to come to the conclusion that leucin was present. In addition, particularly when the fluid had stood for some days (with the addition of a crystal of thymol), a few crystals of tyrosin and some of cholesterin were seen; further, there was a large number of bacteria present and also some bodies which appeared to have the power of movement for a considerable time, but which were probably oil globules. In conclusion, the presence of tyrosin and leucin might, perhaps, point to the cyst being connected with the liver, but the absence of bile pigment is sufficient to negative this idea. The fact, however, of so many products of pancreatic digestion being present (especially globulin, albumose, leucin, and tyrosin), combined with the alkalinity of the fluid, points strongly to the cyst being in connexion with the pancreas.[1] In confirmation of this an analysis of the fluid of a cyst which was proved to be of pancreatic origin shows that the fluid here was alkaline, had a specific gravity of 1013, contained a large amount of albumin, and numerous tyrosin crystals.

CASE 2. *Retro-peritoneal sanguineous cyst.*—A man aged fifty-six years was admitted into St. George's Hospital, under the care of Dr. Penrose, on July 16th, 1895, with the following history. When ten years old he was kicked in the abdomen by a donkey. His left hip-joint was the cause of his admission into Guy's Hospital about a year after this. It was then first discovered that he had an abdominal swelling. This was "pointed out to him by the doctors." Except for an occasional stoppage of the bowels he had always enjoyed good health. Lately there had been considerable increase in the size of the abdominal tumour, attended with much pain in the back, and nocturnal elevation of temperature up to 102° and 102·4° F. The morning record was 99° and 99·5°. He had lost flesh and strength, and looked a pale, feeble man older than his years. There was much wasting of the whole body, especially of the lower limbs. The abdomen on the left side was prominent and distended, with a tense elastic tumour occupying, as shown in Fig. 3, the hypogastric, the left iliac, the left lumbar, and part of the umbilical, regions extending above to the spleen and backwards to the lumbar vertebræ. The hypogastric portion was especially prominent and fluctuating, looking as if it was the distended bladder. Fluid impulse

[1] Transactions of the Royal Medical and Chirurgical Society, vol. lxxiv., p. 461.

could be obtained from all parts of the tumour to its summit, and catheterisation did not affect the hypogastric portion. His urine was acid, had a specific gravity of 1016, and contained a faint trace of albumin. At a consultation held on July 24th it was decided that the rapid increase in the size of the tumour, the nocturnal elevation of the temperature, the pain experienced by the patient and his increasing loss of strength rendered an operation that might possibly relieve him desirable. Accordingly, on July 25th Mr. Turner made an incision some four inches in length in the median line below the umbilicus. On exposing the sac it was found to be closely adherent to the abdominal wall. It was aspirated and a large quantity of thickish fluid of a chocolate colour drawn off. This was found on microscopical examination to be blood in various stages of destruction and cholesterin. On opening the sac the finger passed into a large cavity lined with a mud-like deposit of this material. As much of this as was possible was removed and the whole cyst flushed and washed out with warm water. A large indiarubber drainage-tube was inserted and the cut cyst-wall, a small part of which was reserved for microscopical examination, was sutured to the edges of the abdominal incision. The patient's feebleness was such as to forbid any attempt to remove the cyst, even had such a proceeding been possible.

FIG. 2 (CASE 2).

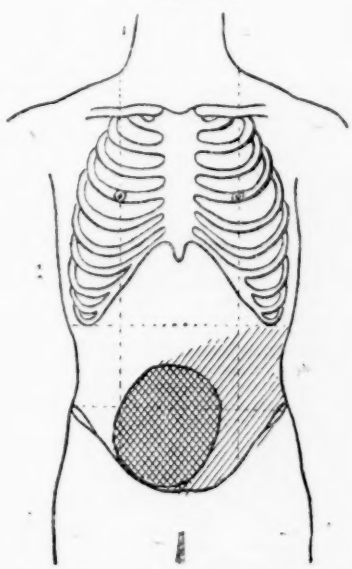


The shaded parts indicate the area of dulness.

The patient expressed himself as much better after the operation, being especially relieved of the pain in the back. There was a copious discharge of brown-stained fluid from the cyst, which was daily flushed and irrigated with a weak antiseptic. The discharge remained quite sweet, the cavity of the cyst became less and less, and, although very feeble and emaciated as before the operation, he did so well that on Aug. 28th, about five weeks after the operation, he was sent to the Morley Convalescent Hospital at Wimbledon. The resident medical officer, writing on Sept. 13th, said "the patient gradually and persistently deteriorated since his arrival at Wimbledon. For the past eight days the discharge from the abdomen has largely increased and become offensive, notwithstanding free irrigation with a solution of tincture of iodine (one drachm to one pint) and afterwards with Condy's fluid. Pernicious anæmia was marked. Gradual loss of appetite and increasing debility preceded death at 5.15 A.M. to-day."

Post-mortem examination by Dr. ROLLESTON.—The cyst grew out of the pelvis and had taken the peritoneum in front of it, so that its external surface was smooth where it was not covered by adherent small intestine. The walls of the cyst were not adherent to the surrounding structures, such as the bladder, rectum, and small intestine. The peritoneum around the cyst showed extensive pigmentation. The wall of the cyst was ragged and was lined inside by dirty, ragged-looking tissue. The cyst had no anatomical connexion with the pancreas or kidney. It grew from the pouch between the bladder and rectum and appeared under the peritoneum over the upper border of the prostate. It did not grow from the prostate, from which it was quite distinct. There was a tumour continuous with the emptied cyst projecting backwards above the bladder. It contained semi-liquid semi-solid material of a dark chocolate colour; microscopically this contained cholesterin and altered blood-clot, but nothing to suggest new growth. Near the large cyst there was a small clear cyst. It appeared to have been a large hæmorrhagic cyst, and the question arises whether it was primarily an hydatid cyst. The left ureter was pressed upon by the cyst, and the left kidney was the seat of hydronephrosis. Some adhesions existed about the spleen and liver. The suprarenals and pancreas were healthy. Microscopical examination of the cyst wall after removal post mortem showed that it was composed of dense old fibrous tissue arranged in lamellæ. Between the fibres pigment granules, exactly like altered blood pigment, were seen scattered about. In places the pigment granules were

FIG. 3 (CASE 2).



The shaded parts indicate the area of dulness; the darker circular part was very prominent and fluctuating.

enclosed in cells. The fibrous wall contained well-formed bloodvessels, but was not excessively vascular. There was no sign of sarcomatous tissue and the lamination was not so fine as that seen in the ectocyst of an hydated cyst. The contents of the cyst even where it was most solid only contained blood and cholesterin. No hooklets were ever found. The vascular areas on the visceral pleura of the left lung were examined microscopically and consisted of small extravasations of blood between the layers of the visceral pleura. In conclusion, there was nothing to suggest that this cyst was other than a peritoneal blood cyst of considerable standing.

Remarks by MR. TURNER.—Rotter [2] states that three-quarters of pancreatic cysts push forward the hinder wall of the omental cavity so that in front of them are the stomach and gastrocolic omentum, below them the transverse colon, and above them the liver. If the tumour increases in size the stomach is pushed upwards and the colon downwards, so that the gastro colic omentum is in front of the cyst and the transverse colon may be so displaced that it lies behind the symphysis pubis. The case above related

[2] Zeitschrift für Geburtshulfe und Gynäkologie, Band xxiii., p. 228.

(Case 1) obviously, I think, belongs to this class rather than to the variety in which the fluid collects between the layers of the transverse mesocolon (in which the colon lies transversely across the cyst above its centre) or to the variety in which, the fluid collecting in the lower layer of the transverse mesocolon, the gut lies along the upper boundary of the tumour. Aspiration has been advocated and practised in the treatment of pancreatic cysts and one successful case in a child aged two years recorded, but I would venture to strongly protest against it. The relations of the stomach and transverse colon, to say nothing of the omentum, to the cyst are such as to render any such proceeding highly dangerous, especially in the most common variety, where they lie directly in front. An abdominal incision allows one to see that no important structure is endangered, and the cyst can be tapped and treated with comparative safety. It may, of course, be possible in thin subjects to detect the position of the transverse colon and stomach by careful palpation before the aspiration is performed, but even then recurrence, or, rather, refilling of the cyst, must be a not unusual occurrence. Dr. Newton Pitt and Mr. Jacobson have related the various accidents, such as perforation of the stomach, peritonitis, collapse, &c., that have followed aspiration without previous abdominal incision. I attributed the abdominal pain and sickness that my patient suffered from on first resuming food by the mouth to the anchored position of the stomach and possible dragging on it and the large nervous plexuses in its new fixed position. Looking to the size attained by these cysts and their relations to such viscera as the stomach and colon it does not seem strange that their evacuation and consequent shrinkage should at first give rise to some intestinal trouble. In the largest cysts when the stomach and colon are more pushed asunder there would not in stitching the cyst wall to the abdominal parietes be the same tension on the stomach, and such symptoms should be rarer. Closely allied to these symptoms in their causation are the collapse and cardiac failure that sometimes almost immediately follow the operation. In connexion with Case 2 it may be observed that the peritoneal sanguineous cysts are of considerable interest. In an exhaustive paper by Dr. Theodore Fisher[3] some 20 cases are carefully examined. Only 1 of these is completely retroperitoneal, 7 being partially so. These latter partly occupied the ascending or descending mesocolon. In but 6 of Dr. Fisher's cases there was a history of traumatism. A considerable interval of time between the injury and the formation of the cyst is constantly seen and this has induced Dr. Fisher to suggest that the cysts may be due to injury done to the large nervous plexuses rather than a direct lesion of the vessels. Rapidly fatal hæmorrhage into the mesocolon and mesentery has been recorded in two cases. Aspiration or tapping has been successful in 4 out of 8 cases. The patients have died in 2 cases out of 4 in which tapping has been followed by the injection of fluid, and the same results have followed extirpation. Laparotomy and stitching the cyst wall to the abdominal parietes have been twice employed successfully. The above statistics are given in Dr. Fisher's paper. The elevated nocturnal temperature, the wasting and feebleness of my patient, together with the constant pain, would have led sooner or later to a fatal issue and made operation the only possible means of relief. From the patient's general condition the contents of the cyst might very well have been purulent, so much constitutional disturbance was there. The complication of hydronephrosis that existed in this case has not, I believe, been observed hitherto in any of these cases. A marked interval between the original injury and the first appearance of any abdominal cyst—in this case a year—is again to be noted.

[3] Guy's Hospital Reports, vol. xlix.

THE NORTH-EASTERN HOSPITAL FOR CHILDREN.—At the bazaar in aid of the North-Eastern Hospital for Children, held at the Queen's Hall, Langham-place, the Duke of Newcastle gave practical illustrations of the new photography and took Roentgen photographs of the hands of the Duchess of Connaught and the Duchess of Marlborough. The bazaar was re-opened on June 25th by the Duchess of Newcastle, and it is hoped that the present debt of the hospital, amounting to about £3000, will now be materially reduced if not entirely cleared off.

Reviews and Notices of Books.

A System of Medicine by Many Writers. Edited by T. CLIFFORD ALLBUTT, M.A., M.D. Cantab., LL.D. Glasg., F.R.C.P. Lond., F.R.S., F.L.S., F.S.A., Regius Professor of Physic in the University of Cambridge. Vol. I., pp. 959. 33 illustrations, 13 charts, and 1 coloured plate. London: Macmillan and Co. 1896. Price 25*s.*

THE appearance of this "System of Medicine" has a pathetic interest in that it is dedicated to one lately passed away, who was the editor of the best-known system of medicine—the late gifted President of the Royal College of Physicians. To review a work of this kind with anything like the fulness it deserves would take far more time and space than we have at our disposal, and we can only shortly set out the plan of the book with its aims and objects.

The editor contributes a scholarly preface pointing out among other things the reasons why historical matter has been for the most part omitted. We cannot but think he is wise, for though the history of medicine is a most fascinating study, yet, after all, the busy practitioner has so much to learn that is modern that he must be content to take as gospel that learning which has slowly broadened down from the precedents of our ancestors without tracing the streams to their fountain heads.

Forty-three authors, British and American, have contributed to this first volume, and the result is a series of short monographs upon the various subjects treated of. In the introduction the editor apologises for the use of the term system. "The reader," he says, "will be disappointed if on opening the following pages he expects to find a system of medicine formally so called, he will rather find our knowledge set forth on the whole as immediate convenience and the exigencies of contemporary learning may dictate." In truth, there never can be written a true "system" of medicine—i.e., a treatise which will be to medicine what the great "Summa" of the Angelic Doctor is to theology. Our knowledge of medicine is ever increasing, and all treatises upon it are but flood marks which show how high the river of knowledge has risen.

The volume opens with a series of prolegomena, of which the first, entitled "Medical Statistics," is the work of Dr. John S. Billings, who, like all men who are masters of their subject, is careful to point out the fallacies to which his particular subject is liable. Dr. John Beddoe writes upon Anthropology and Medicine, and Dr. W. H. Rivers upon Temperament. The former of the two writers brings out the curious relationship that exists between good teeth and a high death-rate. Mr. Jonathan Hutchinson contributes a paper upon the Laws of Inheritance in Disease, illustrated chiefly by the facts known about the inheritance of syphilis.

The subject of the Medical Geography of Great Britain is treated by Mr. Alfred Haviland. The all-important subject of Inflammation is taken in hand by Professor J. G. Adami in an essay extending over some eighty pages, and even this, exhaustive as it is and inclusive of nearly everything that is known upon the subject up to the present, does not pretend in the author's own words, to be a complete treatise upon the development of our knowledge of the subject. Be this as it may, we feel certain that most medical men who read Professor Adami's essay and remember it will know a great deal more of the subject than they ever did before. Professor Burdon Sanderson writes very fully upon the somewhat allied and obscure subject of Fever. Dr. F. W. Mott takes for his subject the General Pathology of Nutrition, and Mr. Shattock and Mr. Ballance the Pathology of New Growths. In this latter paper the work which has been done with reference to the possibility of inoculating malignant disease is fully gone into.

The subject of Climate in the Treatment of Disease is dealt with by Dr. Hermann Weber and Dr. Michael Foster, who consider it primarily under the heads of marine and inland regions. Sea voyages have the advantage of affording absolute repose and facilities for open-air life. The best is that by sailing ship to Australia; others are by steamer to Australia, to the Cape of Good Hope, or to New Zealand round the Cape. Madeira was formerly considered to be the most beneficial residence for "consumptives," but the result of the experiments made by the authorities of Brompton Hospital on twenty selected cases of pulmonary tuberculosis have not been satisfactory, and the climate of Madeira is more to be recommended in cases of bronchial catarrh and in emphysema than in pulmonary tuberculosis. The island of Monach, situated about seven miles westward from the Hebrides, between 57° and 58° N., is said to have warmer winters and cooler summers than an ordinary coast climate farther south, the mean January temperature being higher than that of the Isle of Wight, Jersey, or Guernsey. Inland climates are subdivided by the authors into mountain climates and lowland climates, the Alpine health resorts being the chief examples of the former and Egypt of the latter.

Under the head of Artificial Aerotherapeutics, Dr. C. Theodore Williams gives a detailed account of the compressed air bath in use at the Brompton Hospital, and devotes some space to mercury, sulphur, and steam baths.

The subjects of Balneology and Hydrotherapeutics are appropriately treated in separate articles—that on the former being an extensive survey of the application of natural mineral waters in the treatment of disease; artificial medicated baths, and the various remedial applications of hot and cold water are described under the latter section.

Dr. Lewis Jones contributes a very practical and instructive chapter on the Medical Applications of Electricity. In it he gives an adequate account of the most useful forms of apparatus, explains the phraseology employed by electricians, and shows by illustrative diagrams the various points where the electrodes may be advantageously applied. The chapter concludes with an enumeration of various morbid conditions in which electricity has been found beneficial.

Dr. Kearsley Mitchell writes on Massage, Sir Dyce Duckworth on the General Principles of Dietetics and the Feeding of the Sick, Dr. Eustace Smith on the Diet and Therapeutics of Children, and Miss Amy Hughes on Nursing.

Dr. Clement Dukes of Rugby deals with the question of the Hygiene of Youth in an article the practical value of which is guaranteed by the writer's long experience at Rugby School. His wise counsels as to the danger of unduly forcing the higher mental education of girls deserve the careful attention of all educational and scholastic authorities.

The article on Life Assurance by Dr. E. Symes Thompson will be found very instructive by most practitioners. No doubt the cases of would-be insurers are usually dealt with by the medical examiners of the various companies, but it nevertheless often happens that the opinion of the ordinary medical attendant is sought, especially when the state of the proposer's health leaves something to be desired. In such circumstances the clear and precise explanations given by Dr. Thompson will be of much service to readers unversed in the technicalities of this kind of practice.

Division II. includes the subject of fevers and is divided into two parts, the first dealing with the subjects of sun and heatstroke. This article is written by Sir Joseph Fayrer. Four illustrative cases are given as reported by Brigade-Surgeon-Lieutenant-Colonel Hooper from Lucknow, in which there were three recoveries to one death. The second part deals with the infectious fevers, and commencing with an exhaustive paper upon the General Pathology of Infection. Dr. Kanthack, the writer, begins with a classified table of the infectious diseases—classified mainly from a bacteriological standpoint. Then follows an account of the various bacterial forms, the questions of predisposition and immunity, and, of course, serum therapeutics. These vexed questions are treated in no dogmatic manner; the discoveries hitherto described are marshalled, "trusting that the future will arrange them in their proper order and proportions." Mr. Watson Cheyne writes upon Septicæmia and Pyæmia and Erysipelas. Dr. Dreschfeld treats of Infective Endocarditis and Dr. Playfair of Septic Puerperal Fever. Dr. Milsome describes Boils and Carbuncles, Dr. Whitelegge Epidemic Pneumonia, and Dr. Ormerod that little-known disease Epidemic Cerebro-spinal Meningitis. The subject of Influenza, that "multiform deceiver" of diseases, is ably handled by Dr. J. F. Goodhart. Diphtheria is treated of in its various aspects by Dr. Gee, Dr. Thorne Thorne, Dr. Herringham, and Dr. Kanthack, while with regard to Tetanus Dr. Woodhead is responsible for the bacteriology, and Sir George Humphry treats the subject from the clinical point of view. Dr. Dreschfeld writes upon Enteric Fever. Of the various forms of treatment used he appears to be most favourably impressed with that by cold or tepid water, the latter including the continuous bath. Dr. Kenneth Macleod handles the subject of Asiatic Cholera, and wisely winds up by saying that no single plan or principle of treating cholera has met with much success, but there are certain rules of action which may aid the patient. The views of the late Sir George Johnson upon this subject were published in our issue of June 13th. Dr. Solomon Smith and Mr. E. Hart contribute a chapter upon the epidemiology of the disease, while Dr. Kanthack and Mr. Stephens discuss its bacteriology. The subject of Plague is handled by Dr. J. F. Payne in his usual thorough and scholarly way, and the last article in this volume—Relapsing Fever—is undertaken by Dr. Wesbrook of Minneapolis and Dr. Rabagliati. Every article has a copious bibliography and list of references appended, and there are two admirable indices—one a general one and the other a list of authorities quoted.

This is a necessarily imperfect notice of a work which will most certainly be found to be of high value to the student and practitioner, and we await the appearance of the remaining volumes with great interest.

The Fundus Oculi, with an Ophthalmoscopic Atlas illustrating its Physiological and Pathological Conditions. By W. ADAMS FROST, F.R.C.S. Eng., Ophthalmic Surgeon St. George's Hospital, Surgeon to the Royal Westminster Ophthalmic Hospital. Edinburgh and London: Young J. Pentland. 1896. Price £3 3*s*.

WE congratulate Mr. Frost upon the completion of this important and valuable contribution to ophthalmic literature. Few but those who have made some essays in this direction are aware how arduous the task is to produce a satisfactory series of coloured illustrations of the fundus of the eye. The surgeon who undertakes it must be content to pursue his labours through many long years in order that he may obtain the requisite material. He must be always on the alert to recognise exceptional forms of disease and competent to understand their nature. He must secure his prize when he has discovered it. Many interesting cases occur in the practice of every man connected with a large hospital, but unless captured and described at the moment such cases are lost to science, and the distance at which the patient lives, his non-return till all the interest of the disease has passed away, the fatigue or indisposition of the surgeon, the absence of a reliable draughtsman at the moment when he is most wanted, the necessity of supervising the work of even the most competent artist and of guiding his hand that the chief points may be brought into relief, the correction of the drawings when transferred to stone, and many other circumstances, all

render the production of such a work as this a very protracted and toilsome labour, and a meed of warm praise and congratulation is rightly bestowed on the author who has overcome so many difficulties and brought his *magnum opus* to a successful issue. It is only the practitioner in a great city that can undertake such a work, for it is only amongst a multitude that the opportunity of seeing many forms of disease occurs. There the results of syphilis, both primary and inherited, of scrofula, of mental and bodily overwork, of poverty, hunger, and dirt present themselves in numbers, but time, care, and attention are still required to secure typical specimens of every form. In this respect Mr. Frost has been fortunately situated. Commencing his career at Moorfields, and for many years in attendance at that important centre, and subsequently attached as surgeon to St. George's Hospital and to the Royal Westminster Ophthalmic Hospital, he has had immense experience in the diseases of the eye, whilst that experience has been rendered both precise and available by his constant practice of teaching.

The text is divided into two parts, one treating of the normal conditions with the physiological variations that the fundus may present, and the other dealing with the pathological conditions. The first chapter is devoted to the general anatomy of the structures constituting the fundus of the eye so far as they are visible or as alterations in them become visible in an ophthalmoscopic examination. Mr. Frost prudently abstains from excessive detail, mentioning those points only which are of some practical interest. The next chapter gives an account of the ophthalmoscopic appearance of the optic disc, the surface of which he divides into three zones—a central zone, corresponding to the porus opticus, an intermediate, and a marginal or peripheral zone, which he considers should properly be called the connective tissue ring, since it is formed of comparatively non-vascular tissue, which is probably continuous with the sheath derived from the pia mater of the nerve. A good description of each of these zones is given, with references to illustrative examples in the figures. The author notices the peculiar play of light, resembling shot-silk, which is seen around the disc in young subjects, and justly remarks that its shiftiness and unreality render it difficult to depict satisfactorily, since as soon as it is fixed in a drawing it has an unnatural hardness. The illustrations given of this appearance are much better than those hitherto published. The different forms of physiological cups and the differences in form and colour of the disc are given at considerable length. The retinal vessels form the subject of the next chapter and good representations of the chief varieties of vascular distribution and arrangement are given. The author does not content himself with the numerous exceptional conditions exhibited in the chromo-lithographs, but inserts no less than fourteen well-executed cuts in black and white into the text, drawn partly from his own experience and partly from remarkable cases depicted by others. A chapter is devoted to the appearances presented by the macula, and especial reference is made to the fine striation and to the minute yellowish and well-defined dots first described by Mr. Gunn, which are occasionally seen at this point, and which appear to be compatible with perfect vision. A section on Developmental Irregularities follows, which includes coloboma of the choroid, opaque nerve fibres, congenital crescent of the disc, and coloboma of the disc. In the last-named affection the author takes up a position which is open to discussion and to some difference of opinion, as he holds that the white crescent not unfrequently seen as a congenital condition partially surrounding the disc belongs properly to the optic disc and is produced by the nerve bundles being accumulated to one side of the nerve, causing the connective tissue, which should be distributed equably, to be thrust to one side. The relations of the crescent to coloboma of the disc are interestingly given and conclude the description of the normal fundus. The remainder of the text is occupied with the pathological conditions.

In conclusion we may repeat that the work is a credit to British ophthalmological literature. The text is printed in very legible type and has very few typographical errors, the only ones we have noticed being the following: page 3, line 10, Plate III., Fig. 5, should be Plate II.; and on the same page, Plate IV., Fig. 3, should be Plate III. Page 131, line 3, Plate XXXVI. should be Plate XXXVII. In the description of Plate XXXIII., sq. mm., p. 119, should be cubic mm. There is also some mistake in the legend of the woodcut on page 31, which, instead of C. choroid sclerotics should be C. choroid S. sclerotic, and the lettering, including L. c, vi, ve, are not noticed.

The coloured illustrations are 107 in number and the woodcuts (many of them very elaborate) and fields of vision are fifty-seven. We cannot undertake to enumerate all the forms of disease represented. It is sufficient to say that they exhibit all the more important forms which the student or practitioner is likely to meet with, whether of the choroid, optic nerve, or retina, that the conditions of disease visible in the fundus and resulting from Bright's disease, diabetes, and leucocythæmia, the forms of papillitis proceeding from orbital, intracranial, and other causes, the pigmented and punctated conditions of the retina, the appearances presented in glaucoma, in atrophy of the disc in embolism and thrombosis, and in detachment of the retina are all here, with many more, abundantly illustrated, and to each illustration a short account of the case from which it was taken is appended, whilst the text contains a full description of the appearances presented in each form of disease.

Great praise is due to the artist employed by Mr. Frost, Mr. A. W. Head, whose coloured drawings bear the impress of fidelity on their face. He has selected a size, varying from about two to about six inches in diameter, which permits the reproduction of very minute details, and the colours selected, alike for the general fundus, for the disc and retinal vessels, and for the pathological conditions represented, are excellent. The large majority of the illustrations are drawn from the direct examination of the fundus.

The Diseases of Children, Medical and Surgical. By HENRY ASHBY, M.D., F.R.C.P. Lond., and G. A. WRIGHT, M.B. Oxon., F.R.C.S. Eng. Third Edition. London: Longmans, Green, and Co. 1896.

THE last edition of this well-known work appeared in 1892, and since that time the progress of knowledge has rendered necessary a considerable amount of revision and addition to the volume. This has been carefully and thoroughly done and the book should maintain its high reputation as a complete manual of children's diseases, medical and surgical. There is much to be said in favour of treating the two branches of the subject together, for in children's diseases especially do they tend to pass one into the other. The present edition is enlarged by some fifty pages and several new woodcuts have been added. The chapter on the important subject of infant feeding has been brought well up to date and will be found a very valuable guide. There is a very fair account of diphtheria and stress is justly laid on efficient local disinfection of the fauces, though much more might have been said of the serum treatment, which receives only a brief notice in the text and half a page in an appendix. Recent researches on the blood are incorporated in the chapter on Anæmia, and the work of Kanthack and Hardy is largely drawn upon in this connexion. While the medical aspect of the book has thus received due alterations and additions the surgical side has been equally well treated and recent additions to our knowledge introduced in their due

place. The chapter on Hip Disease is, as might be expected from so great an authority on the subject as Mr. Wright, of particular value and excellence. The authors are to be congratulated on the care and thoroughness with which the work has been revised; the illustrative cases which are introduced are well chosen, and not a little of its value is due to the fact that it is mainly based on their own practical experience.

Water Analysis. By J. ALFRED WANKLYN, M.R.C.S. Eng. London: Kegan Paul, Trench, Trübner, and Co. 1896.

"I DO not attach much importance to the bacteriological examination of water; if the water be returned as 'dirty' by the chemical examination the failure to discover anything very alarming by the bacteriological examination would not induce me to recommend the water. If, on the other hand, the water belong to the class of exquisitely pure water no bacteriological results are possible. Even as an aid to the material for judging those waters which are intermediate in chemical character I hold that bacteriological examination is of very little avail." We recommend Professor Wanklyn to read the history of the Worthing epidemic of typhoid fever, and contrast Dr. Dupré's report, founded on chemical examination, with Dr. Klein's report, founded on bacteriological examination. The latter analysis condemned the water, the former did not; the unfortunate epidemic confirmed Dr. Klein's results. We might also refer to similar instances recorded in the report of the Royal Commission on the London Water-supply. Professor Wanklyn's name will ever be remembered, as, indeed, it should be, in connexion with one of the most accurate and delicate processes for the detection and estimation of organic impurity in water. We refer to the well-known albuminoid ammonia process, which affords practically the only factor in the results of water analysis by chemical methods upon which any useful diagnosis may be based. The little work before us is devoted to the description of this as well as of other methods which in some respects are useful towards the same end. The moist combustion process described on page 56 in Chapter V., depending upon the oxidation of the organic matter by strongly alkaline permanganate, appears to us to deserve more attention than has hitherto been bestowed upon it. The book contains useful data bearing on the composition of various water-supplies as well as on some natural mineral waters. Professor Wanklyn's views on the indication afforded by nitrates are not shared by the generality of chemists. He thinks that nitrates are of little significance in judging of the organic quality of a water. So do we, but all the same they may very definitely indicate what may become a probable source and risk of contamination at any time. The author is mistaken in his remarks on the existence of phosphates in water. Phosphate of lime is distinctly soluble in water, and especially when free carbonic acid is present or in the presence of alkaline salts.

LIBRARY TABLE.

Criminal Sociology. By ENRICO FERRI. London: T. Fisher Unwin. 1895. Price 6*s.*—This book is a translation of a portion of Professor Ferri's volume on "Criminal Sociology" and contains much interesting matter on the data of criminal anthropology, and he also discusses the value of punishment in preventing crime, and his remarks on this subject are worthy of wide distribution amongst those who are responsible for dealing with the criminal classes. He makes several valuable suggestions in the direction of practical reforms. Thus he maintains that for every crime which is committed the problem of punishment ought no longer to consist in administering a particular dose as being proportionate to the moral culpability of the criminal; but it should be limited to the question whether by the actual conditions (breach of law or infliction of injury) and by the personal conditions (the anthropological type of the criminal) it is necessary to separate the offender from his social environment for ever, or for a longer or shorter period, according as he is or is not regarded as capable of being restored to society. But there is one point upon which we should like further information—that is, the new use for the sphygmograph that the author states has been discovered. We quote verbatim: "Thus the sphygmographic data on the circulation of the blood, which reveal the inner emotions in spite of an outward appearance of calm or indifference, have already served to show that a person accused of theft was not guilty of it, but that he was, on the contrary, guilty of another theft of which he had not been so much as suspected. On another occasion they established the innocence of a man condemned to death." In order to fully understand these statements we need a more full explanation from Dr. Anfosso, whom we gather from the context is responsible for these statements. We do not wish to be facetious, but cannot help imagining how this discovery would have delighted the defunct Sherlock Holmes.

Rough Notes on Remedies. By WILLIAM MURRAY, M.D. Durh., F.R.C.P. Lond. London: H. K. Lewis, Gower-street. 1896. Price 3*s.* 6*d.*—This little book consists of papers which have appeared in our pages[1] and in those of the *Northumberland and Durham Medical Journal*, and we can fully guarantee that its contents are well worth re-publication. The object of the author has been to draw attention to the fact that the action of some very old-fashioned remedies is by no means limited to our present knowledge, and to assist in further research by the powerful adjuvant of clinical observation. Arsenic in chorea, diabetes, and asthma; belladonna in various pathological conditions of the kidney and bowel; mercury in heart disease; calomel; nitrate of silver in epilepsy are the themes, while the papers are prefaced by a wise and brief introduction and rounded off by a few words upon the true significance of making mistakes. This little book of eighty pages is full of sound practical teaching. It is studiously plain in its presentment of its subject, as is indicated by its modest title, but it gives much instruction, and rightly used should lead to much learning.

Bradshaw's Dictionary of Bathing Places and Climatic Health Resorts. London: Kegan Paul, Trench, Trübner, and Co. Price 3*s.* 6*d.*—This well-known little publication is addressed as much to the public as to the medical profession, but each section of its readers will find it of use. The introductory chapters, including hints upon "drinking the waters" at various places, upon continental travelling, routes, outfits, &c., contain much that is surely superfluous nowadays, but they are very short, while the real contents of the book, viz., the alphabetical list of health resorts, constitute a very valuable little manual of reference. Under each name of a place are given the character of the waters, the diseases for which they have been recommended by the profession, and brief notes as to the population of the place and its hotel accommodation. We know that to many persons the dictionary will prove itself of real service.

Dress and Health. By CHARLES MOORE JESSOP, M.R.C.P. Lond. London: Elliot Stock, 62, Paternoster-row, E.C. Price 1*s.*—This little book calls itself in a sub-title "An Appeal to Antiquity and Common Sense," and consists of two essays read before the British Medical Association respectively at Dublin in 1887 and Leeds in 1889 and now edited and expanded. The first, entitled "The Value of Fluid Cheap Food and Waste in the Method of its Preparation," is written more especially for the instruction of those

[1] Feb. 25th, 1893; Nov. 4th, 1893; Sept. 21st, 1895; and Sept. 28th, 1895.

who are interested in charitable institutions, and gives sound practical information as to the proper method of making the much-used and much-abused beef-tea. The second essay, entitled "Ancient Dress Compared with Modern," is addressed rather to the lower classes at large than to the medical man; but the information given is of a rambling and vague sort not likely to be useful in any practical way, though making pleasant enough reading.

Alpine Notes and the Climbing Foot. By GEORGE WHERRY, M.A., M.C. Cantab., F.R.C.S. Eng., Surgeon to Addenbrooke's Hospital. Cambridge: Macmillan and Bowes.—This little book consists of pages written in the train on the author's return from an Alpine tour and addressed to the *Cambridge Chronicle* as a record of five mountaineering seasons. A few words are added separately upon the "Climbing Foot." Mr. Wherry had the bare feet of his guides photographed in different positions, and also the bare feet of an infant, the flexibility of whose ankle-joint is well shown. He comes to the conclusion that the skill shown by the Alpine guide as he walks straight up a slope with his face to the front where the amateur must turn sideways while he hunts for a resting-place for his heel is all due to practice in the preservation of balance, and is not to be attributed to any structural difference in the joints produced by the regular occupation of climbing. There is no approximation in the guide's foot to the mobility of the baby's foot, as might have been supposed by the ordinary observer.

Moorland Idylls. By GRANT ALLEN. London: Chatto and Windus. Price 6*s*.—Mr. Grant Allen is not a very important man of science; his original contributions to the study of evolution will never earn him the Fellowship of the Royal Society (we do not mean to imply that he hopes or expects that they will), nor does his hill-top psychology command the respect of a high level of thinkers. But he is a practised writer and a keen observer, and "Moorland Idylls" displays him in both characters at his best. These little papers on practical natural history will be read with equal pleasure by those who do and those who do not know anything of the matter described. To the latter they will be news, to the former recollections, but to both they will bring pleasure, they are so clever, so unstudied, so graceful, and so accurate. We strongly recommend this little book to our readers.

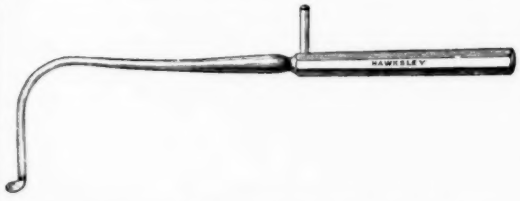
JOURNALS AND REVIEWS.

Annales de l'Institut Pasteur. Edited by M. E. DUCLAUX. Tome X., No. 5.—The May number of this journal contains a very interesting article by M. Metchnikoff, M. E. Roux, and M. Salimbeni on the Toxine and Antitoxin of Cholera. Experiments made on guinea-pigs showed conclusively that the actual poisoning was due to the presence of the toxine in the blood and not to the bacilli. A small sealed capsule of collodion containing a culture of cholera bacilli in bouillon was introduced into the peritoneal cavity. The toxine could diffuse through the wall but the bacilli could not escape. The animals died with the usual symptoms, but no bacilli were discovered in any of the organs. It was found that by injecting small quantities of the bouillon containing the toxine, but freed from bacilli by filtering, animals could ultimately be rendered immune. Further, that if doses of the toxine were injected into a horse there was considerable local and general reaction at first, which decreased with successive injections, and the serum drawn from such animals showed the most marked antitoxic effect. The paper is of extreme interest and is very clearly written. M. G. Roux, M. Trillat, and M. Bose describe experiments proving the value of the Vapour of Formaldehyde, even in the absence of moisture, in disinfecting rooms, a method which promises to be of great value.

New Inventions.

A NEW MASTOID-ANTRUM GUIDE.

THESE instruments are made by Mr. Hawksley, of 357, Oxford-street, and are intended to fulfil the following conditions: (1) the footplate is somewhat hollowed out at the heel to avoid possible compression of the facial artery; (2) its size and shape are the largest allowed anatomically;



(3) when in position it also retracts the concha and external meatus; (4) it cannot slip when once in position; and (5) the upright bar in the handle shows the direction of the shaft and assists in steadying the instrument. They are made to my design and appear to me to be superior to the present guides.

Harley-street. R. LAKE, F.R.C.S. Eng.

THE DIFFUSION OF SMALL-POX.—The four weeks ended June 13th witnessed 17 notified cases of small-pox in the county of London. These occurred in residents in eleven sanitary districts, the most heavily invaded having been Islington with 5 notified attacks. The deaths in the same period were nil, and the average weekly number of attacks only 4, as compared with 22 notifications and 2 deaths in the preceding period of four weeks. In the corresponding period of 1895 the notifications were, curiously enough, identical with those just quoted. It was in the middle of June of last year that small-pox began to increase rapidly, running into three figures in several successive four-weekly periods in the summer and autumn. Quite recently the localisation of small-pox cases in Islington referred to above has become intensified, as some score of cases have been notified within a small area of that parish and have been giving the authorities some anxiety. Last week there was one death registered in London from the disease, the person being an unvaccinated woman, who had been removed from Paddington sanitary area to the hospital ship *Atlas*. The Registrar-General records the admission of only 6 cases to hospital last week from the metropolitan area, and says that at the close of the week there remained under isolation in hospital 32 patients suffering from the malady, as compared with 41 on the preceding Saturday. The Mayor of Maidstone has written to the press contradicting the statements that there has been small-pox there this year, he stating that no case of the disease has occurred in the town during the present year. The Gloucester sanitary committee have reported that in the week ended Thursday, June 25th, there were only 13 fresh cases of small-pox in the city, making the grand total of 1965 in the whole course of the epidemic. The deaths in the week were 3, of which 2 occurred in hospital, to which institution there were 8 admissions, 19 discharges taking place. The occurrences for seven successive weeks up to, and inclusive of, the date named have been 84, 47, 42, 56, 25, 16, and 13. Thus there is sustained evidence of the decline of the epidemic. Seven cases of small-pox have recently been reported from one house in Ross. A case of small-pox at Middleton, in Lancashire, has occasioned some alarm, as it has been difficult to trace the source of infection. But the patient has been removed to the Marland Hospital, and all precautions have been taken to prevent the spread of the disease.

THE LANCET.

LONDON: SATURDAY, JULY 4, 1896.

THE time approaches when we shall be able to consider the investigations of our Special Commissioner into the working of the new developments of the club system as practically complete. It is everywhere conceded that he has done his work with an excellent grasp of details, with an appreciation of local circumstances, and with a sense of the general principles underlying the new development which is the first essential to the application of any intelligent remedies for a state of matters threatening the ruin of general practice. We speak of the new developments of the club system, for we recognise that in some form or other the club system must exist. Not that we ever admit that it is a satisfactory one. We have such high respect for the sick that we would surround every sick person with an atmosphere of privacy if it were possible to do so. The model arrangement for the working-man and his family, as for all other men, is to have the services of a private practitioner whom he knows, and who knows him, and who, by the very fact of personal selection and continuous attendance, comes to take a human interest in them and their diseases, which is scarcely possible under the crowded and promiscuous conditions of club practice. All medical men have such patients of the working class, and there is no practitioner who does not regard it as a pleasure to include them in his *clientèle* and to accommodate his charges to their means. The charges need not be large. They need not exceed the sum that persons in this rank of life spend say in beer. But if honestly and cheerfully paid they are amongst the most appreciated of medical fees. All this wholesale attendance in monster clubs, as in a place like Leicester, where it is said that 75 per cent. of the population are so treated, is a departure from that private attendance which is the arrangement to be aimed at by all self-respecting classes of society. But recognising the fact that clubs must exist while the present rage for them continues we have a right to insist on the exposure of the evils of the new developments, especially after so prolonged and elaborate an investigation as we have recorded in the communications of our Special Commissioner entitled "The Battle of the Clubs." Under the old club system the numbers were limited, so limited that the medical man knew the social and domestic circumstances of those whom he attended and knew these to be such as to warrant special terms of accommodation with them. The limitation of numbers also secured the absence of undue pressure. But having regard to the huge proportions of present clubs and medical aid associations, the medical attendance department of commercial companies, and the management by lay committees or by paid agents, it is futile to ignore the fact that our necks are being submitted to the yokes of lay oppressors with mere commercial interests, a fact which is humiliating to the profession and unfavourable to its best action. It is our intention shortly to publish in a separate volume the series of communications to which we refer. They will serve as a standing proof of the perils to which the profession is exposed and to avert which all its best endeavours will have to be exerted.

We shall here only indicate a few of the facts which have been established beyond all doubt. First and foremost is the fact that the club system is now everywhere abused. It was confessedly meant in its origin for the working classes, and indeed only for the poorer of these. The foreman and the well-to-do mechanic used to think it a point of honour and of pride to have his family doctor. But now the club is abused by ex-mayors, aldermen, publicans, tradesmen, and even professional men. So gross and general is this abuse that for twelve months we have been week after week recording in our pages the use of clubs by well-to-do people, sometimes members of semi-charitable dispensaries, as in Leicester, who would blush to admit that they were receiving charitable allowance; sometimes, as in Lincoln, gentlemen of high standing in the community, who have been getting medical attendance for 3*s.* 6*d.* a year as members of clubs or of medical aid associations, but who would be ashamed to take the sick money to which as members they are entitled. Who can explain the peculiarity in the psychological constitution of an honourable gentleman which allows him to take medical service from a highly-educated practitioner for a pittance of three or four shillings a year, whilst he would be ashamed to take advantage of the other privileges of membership? Although this peculiarity remains an enigma we must not lay on it the whole blame of our troubles as a profession. The "Battle of the Clubs" could not go on to the detriment of all honourable practice without the assistance of certain classes in our own ranks. Our Special Commissioner indicates especially two such classes. One is the young or struggling practitioner who is tempted to take advantage of the vacancies caused by the resignation of the men who are fighting the battle against sweating. Another class is that of consultants. Some are in just sympathy with the men who have to bear the burden and heat of practice in its most arduous and least remunerated departments. But some are not, and place themselves unreservedly at the service of those who are bringing medical attendance into contempt. These points are all brought out vividly in the communications which we hope soon to publish collectively and which bring to light a condition of things that must engage the attention of every practitioner, of every medical association, and even of the bodies which administer the discipline of the profession. If rightly used and appreciated our little book on "The Battle of the Clubs" will, we trust, move every sleepy society and individual amongst us to greater diligence for the maintenance of the *morale* and the rights of the profession.

THE publication of the life of OLIVER WENDELL HOLMES by Mr. JOHN T. MORSE, jun., will revive interest in the personal career of a charming writer and good man, who, according to Dr. OSLER, a very competent authority, is the best instance which history affords of the successful combination of the physician and the man of letters. This

combination is rare for many reasons, some of which lie on the surface while others are more remote. The career of a medical practitioner is an arduous one, and except in a few favoured cases leaves little leisure for the successful prosecution of literary pursuits. On the other hand, for the attainment of any high degree of literary excellence ample time for reading, study, thought, and in a general way for self-culture is usually indispensable. Again, the physician is immersed in studies and duties which do not lend themselves very readily to literary expression, and he is prevented by professional etiquette and by good taste from making free use of the incidents of ordinary life as pabulum for authorship. It may, indeed, be doubted whether any body of men "see life steadily and see it whole" more truly than the practitioners of medicine; and such an apprenticeship might seem to be no unfitting preparation for such literary work as the writing of fiction. But in spite of a few brilliant instances to the contrary—of whom Dr. CONAN DOYLE is the most recent—physicians have not been great novelists, or *vice versâ*. Where gifts for practice and gifts for literature have co-existed in the same individual, the tendency has always been for one or the other to swallow up all the individual's energies and to brook no rivalry. Readers of HIPPOCRATES and GALEN will probably agree that if these distinguished men had not elected to be great physicians they would have been great writers, and a similar feeling comes over us now and again when perusing the lectures of Sir THOMAS WATSON. Much commoner has been the phenomenon of the born poet, essayist, or novelist taking to medicine by some untoward accident, failing miserably, and then later discovering his true *métier*. Such was the case of GOLDSMITH, of SMOLLETT, and of KEATS. Of high excellence in medicine and literature the following examples occur to us—viz., Sir THOMAS BROWNE, ARBUTHNOT, OLIVER WENDELL HOLMES, and JOHN BROWN. We will not venture to apportion their various merits, but it may be said of HOLMES that, if less original and profound than the author of "Hydriotaphia," he was much more diversely gifted and he has appealed to a vastly wider circle of readers. A true poet, a born essayist, a brilliant and kindly wit, OLIVER WENDELL HOLMES deserves to live long in the memory and affection of mankind.

It is satisfactory to find from this biography that the subject of it ever retained intimate and friendly relations with the profession of medicine. That profession attracted him in his youth, when he had abandoned law in disgust after a brief trial. He threw himself with ardour and enthusiasm into medical study, and the record of his work in Paris under the great LOUIS is that of a zealous and untiring student. He seems to have imbibed a full measure of the reigning scepticism regarding treatment, and notes as one of the great lessons of his Parisian career the maxim that "because a man is sick is no reason why he should take physic." In after-life HOLMES allowed his ever active wit to play upon his profession as upon everything else, and we must not commit the *bêtise* of confounding the flash of artillery with reasoned conviction and assured belief. When on one occasion he said that "if all the medicines in the world were thrown into the sea it would be a good thing for mankind but a bad thing for the fishes," we recognise the humourist of the breakfast-table rather than the man of science. It is probable that this turn for satire was a serious hindrance to him in practice, as a very reasonable instinct inclines mankind to prefer to have their ailments taken seriously. His professional success seems to have been moderate, and after a time practice was entirely abandoned in favour of literature and of the duties of the Chair of Anatomy in Harvard University, to which he had been appointed. His success as professor seems to have been by no means contemptible, and he continued to lecture with efficiency and popularity for considerably over thirty years. He had a real love for anatomy, though the taste seems on the whole an unlikely one for a poet, and he devoted much labour and zeal to the work of his class. His relations to his professional brethren seem to have been in the main singularly cordial, and it is pleasant to meet in Mr. MORSE'S pages frequent mention of such well-known names as WEIR MITCHELL, BIGELOW, and OSLER. The one instance in which HOLMES found himself involved in unpleasant professional controversy was when he wrote his well-known papers on the contagiousness of puerperal fever. It is much to his honour that the views enunciated in those papers are now among the commonplaces of medicine.

Though Dr. HOLMES finally all but abandoned medicine for literature, his professional training and experiences continued to colour notably his literary productions. In the natural felicitous use of medical terms and ideas—free from every trace of pedantry—he has no rival. What can be more delightful than the following passage which we select almost at random: "Saddle-leather is in some respects even preferable to sole-leather. The principal objection to it is of a financial character. But you may be sure that BACON and SYDENHAM did not recommend it for nothing. One's hepar, or in vulgar language liver—a ponderous organ weighing three or four pounds—goes up and down like the dash of a churn in the midst of the other vital arrangements at every step of a trotting horse. The brains also are shaken up, like coppers in a money-box. Riding is good, for those that are born with a silver-mounted bridle in their hand, and can ride as much and as often as they like without thinking all the time they hear that steady grinding sound as the horse's jaws triturate with calm lateral movement the bank-bills and promises to pay upon which it is notorious that the profligate animal in question feeds day and night."

OLIVER WENDELL HOLMES is the best known instance which the century affords that medicine and letters are not necessarily opposed and that there is no inherent antagonism between the qualities which constitute a wise physician and an efficient anatomist and those of the poet, humourist, and sage. We rejoice that it is so. In these days of all-absorbing science the claims of literature recede, perhaps rightly, but it will only be for a season. Literature is perennially interesting, perennially fruitful. We trust the members of our profession will always be its lovers and not rarely its successful cultivators.

THE conference of sanitary authorities which was recently held in St. Pancras, at which it was resolved that the Vaccination Acts ought to be administered by the authorities which administer the Acts for the prevention of the spread

of infectious diseases, emphasises anew the strong and growing feeling that vaccination should no longer be a matter for the Poor-law authority but for the authority whose interests are most at stake in the prevention of small-pox. The Poor-law guardians in some unions have little or no care whether or not small-pox breaks out in the central town or city of their union; they will have but little, if anything, to pay for the erection of isolation hospitals, for the procuring of additional sanitary officials and nurses, or for such matters as disinfection. On the other hand, the authorities of towns or the district councils, on whom all these heavy expenses will have to fall if small-pox spreads, have at times to stand idly by whilst the board of guardians refuse to carry out the provisions of the law as to vaccination; and where the area and representation of the sanitary district is small compared with those of the union the sanitary authorities are wholly crippled against their will. And if matters remain as they now are the evil is likely to increase rather than decrease. Vaccination and intelligence, the result of superior class education, nearly always go hand in hand, and it is notorious that in many unions the ex-officio guardians, by their votes and influence, have prevented many Poor-law authorities from joining the list of defaulters in the matter of the vaccination laws. But, under recent legislation, the magistrate as ex-officio guardian has no further existence, and the guardians are coming more and more to be a body of men who think first of all of doling out the poor-rates. Is it right and proper, with the experience we have before us, that such a body should retain this solitary but important sanitary function? This is a question that needs the most serious consideration of the Royal Commission on Vaccination. We have no hesitation as to the proper answer. We regard the present state of affairs as altogether anomalous, and one that would never have been dreamed of if the vaccination laws had been passed after 1872, when our sanitary organisation was definitely established.

But whilst we hold this view we do not think it desirable to hand over the carrying out and administration of the Vaccination Acts, together with the question of lymph supplies, to each and every little urban authority, such as exist in shoals in Lancashire and Yorkshire, and who were originally created local boards of *health* merely because they wanted control of their roads. Where a sanitary authority has not to do with a large and important population, some union of sanitary districts—as, for example, under county councils—should be organised; and in no one city—even including the metropolis—should there be any division of authority in this matter. By a few writers on this subject it has been alleged that county boroughs and county councils would object to have this duty cast upon them. As to this, there is no question but that many boards of guardians equally object to it; and it is obvious that the view for or against would entirely depend upon the Act that has in the future to be administered, and especially as to the form of compulsion that is to be resorted to. No one can judge from the present Act and its requirements how any particular set of bodies would view the carrying out of an altogether different Act; and it is only the Royal Commission on Vaccination, who by this time must have finally settled what form our future vaccination administration is to take, who can form an opinion whether they are going to hand over to the vaccination authority of the future a duty which will be essentially disagreeable, or one the public health importance of which will so completely outweigh the drawbacks which attach to every form of sanitary law and compulsion as to make the duty a coveted and an honourable one.

Annotations.

"Ne quid nimis."

THE LANCET SPECIAL COMMISSION ON THE RELATIVE EFFICIENCY AND COST OF PLUMBERS' WORK.

WE present our readers to-day with a report the importance of which we are confident will be conceded by every member of the community. We refer to THE LANCET Special Commission on the Relative Efficiency and Cost of Plumbers' Work. We believe we are right in stating that it is the first practical and public endeavour to grapple with a question the placing of which on a more satisfactory basis is, and has been for a long time, a desideratum. There can be no doubt of the existence of considerable defects in regard to the sanitary arrangements of many houses, and these defects are to be accounted for, first, because of the general indifference shown previously, but not so much now, by the majority of the public to the importance of efficient sanitary work; and, secondly, to inefficiency of the work on account of cheapness. In regard to the first reason, the public, it is satisfactory to observe, have largely been made alive to the great risks and danger of indifference in this matter by the zeal of the medical profession in insisting upon the important relation which drainage has to the public health. In fact, so convincing and so conclusive is the evidence bearing on this point, and so deeply and effectively have these views been inculcated into the public mind, that at the present day instead of indifference the greatest interest and concern are evinced in the construction of the sanitary arrangements of the house. Indeed, the public require no further admonition as to the necessity of good sanitary work. That being so, the next and proper step is to place at their disposal reliable information as to how to secure efficient work and at what cost. This is the paramount aim of "THE LANCET Special Commission on the Relative Efficiency and Cost of Plumbers' Work," which we print as a supplement to our present number. As necessarily we do not appeal to lay readers in the columns of THE LANCET the report will subsequently be reprinted in book form so as to be at the disposal of all those who are interested in this very important matter. The report has been drawn up with very great care in regard to detail, and has entailed, as may be imagined, a very considerable amount of labour and time. It has already been dealt with by a special committee appointed by the Worshipful Company of Plumbers, who have courteously offered criticisms and suggestions upon the conclusions drawn up. These remarks will be found prefacing the report. It is a matter of gratification to us that this committee are able to say that "the report, taken as a whole, may be regarded as a unique work on the subject of the efficiency and cost of plumbing work, and is calculated, if studied attentively, to assist members of the medical profession, sanitary authorities, and others in arriving at a more correct judgment than commonly prevails as to the chief causes of the defective and insanitary

plumbers' work frequently met with and to afford them some useful information as to the cost of plumbing work which is sound in construction and sanitary in character." "We are of opinion," it is added, "that the Editors of THE LANCET are entitled to credit for having set on foot the first impartial and systematic inquiry into the matter, and especially for having grappled with the thorny and difficult question of price, which has an obvious, though often ignored, bearing on the efficiency of plumbers' work." We need say no more, except that we submit the report with confidence to the medical profession, the building and allied professions, and to the public at large, whose well-being it closely concerns and in whose interests the inquiry was expressly undertaken.

"ISOPATHY."

THE introduction of pepsin into the Pharmacopœia marked a new departure in practical therapeutics, the results of which more than justified the innovation and naturally led to the employment of the other digestive ferments—pancreatin, &c.—in cases where the symptoms were obviously due to a deficiency of these secretions. Bile had, indeed, already been in use to a greater extent perhaps than it has been of late. But in all these we have definite chemical compounds or distinct ferments capable of isolation and preservation. In the injection of toxines for the induction of a mild form of such diseases as confer future insusceptibility to infection, suggested by the empirical practice of inoculation and vaccination, and in the more scientific and rational employment of antitoxins conferring insusceptibility without the risk or inconvenience of subjecting the patient to an attack, however modified, of the disease against which protection is sought, a practice the future possibilities of which may effect almost a revolution in medicine, we are still dealing with bodies whose properties are manifest in their effects, though they may not have been, and perhaps may never be, obtainable in a state of purity and isolation. No such ferment, albumose, or chemical body has as yet been detected in the cells of the thyroid gland, but the palpable connexion between atrophy or degeneration of this organ, with certain definite structural and functional changes in the organism and the brilliant results of injection or ingestion of its juices or substance in such or in allied conditions, afford strong circumstantial evidence of the existence of some secretions by this and probably by other ductless glands the functions of which are exercised on the general nutrition of various organs and tissues. So, too, with the suprarenal glands, if we may credit the statements of Dr. Oliver and others that no drug—in fact, nothing but direct stimulation of the bulb—excites such a degree of arterial tension as does the administration of their substance, we must ascribe to them an important function, and assume the presence of some as yet undiscovered secretion. But here we must draw the line, for it is scarcely credible that organs, the integrity, or even the presence of which is absolutely non-essential to health—organs which have well-recognised functions, but functions in no way connected with nutrition—can possess any such properties, or that the ingestion of their substance can provide a panacea for the diseases to which they are liable. "Isopathy," as the Americans call it, seems to us a retrogression to the superstitions of the middle ages or the practices of cannibals, who believe that by eating the heart of a hero they become heroes themselves. In a list of preparations of so-called advanced pharmacy which has been widely distributed among medical men we observe preparations of uterine, ovarian, renal, splenic, and salivary gland tissue, and pineal and pituitary extracts, which, we are told, "are supposed" to exert some influence on disorders of these organs or, in the case of the two last mentioned, some unknown action on the system generally; but we are not informed whether the ovaries, &c., employed are those of man, beast, or bird. Hearts, kidneys, and brains are daily consumed by tens and hundreds of thousands without any perceptible influence on the functions of these organs in health or disease; and we would sooner believe in the superiority of a homœopathic globule of triturated carbo vegetabilis to the infinitely larger dose of the same taken in a slice of toasted bread than in the virtues of a few grains of dried kidney when the entire gland is absolutely inert save as an agreeable and wholesome article of food. That injections of these preparations may cause serious disturbance is quite conceivable, for saliva thus introduced may give rise to symptoms of poisoning, but this is altogether a different question, and the "dangerous consequences" which, we are told, may follow an excessive (*sic*) initial dose given *per os* must, we think, be due to some products of decomposition and not to the swallowing of a few grains more or less of so innocent a matter as kidney substance.

STREET NOISES.

AT last there appear some signs that in the course of the next few years or so some of the totally unnecessary noises of London may be checked. To our mind by far the most offensive of all noise producers is the newspaper "runner." To name only two districts, the Strand and South Kensington are infested with a horde compared to which that of Genghis Khan was a band of benefactors. "Runners" in the Strand are innumerable, but outside South Kensington Station we have frequently counted as many as fifteen, all yelling. The police do their best, but they have no powers, for we suppose the use of a voice like a fog-horn does not come under the head of "using a noisy instrument." The County Council, we see, is considering a report and the Home Office has "promised every assistance." We all know how much that means. There is Mr. Jacoby's Bill all ready; let the Government pass it, or if they do not like that Bill give the County Council powers to make the by-laws it wants. However, it is some slight consolation to know that those in authority have at last come to the conclusion that they want to do something even if at present they cannot.

THE BOWMAN LECTURE.

EVERY ophthalmic surgeon is well aware that the acuteness of vision of his patients varies with the brightness of the day on which the examination is made. In London, where an atmosphere charged with mist and particles of carbon is of common occurrence, the difference in the visual acuity on a foggy as compared with a sunny day, is sometimes as great as one-quarter or one-half and hence some practitioners prefer, in examining their patients, to employ an artificial instead of the natural source of light for the illumination of their test types. Even this method, however, owing to the different luminosity of the flames of lamps or candles, is not by any means an accurate method owing to variations in the quality of the illuminating agent. From these circumstances complaints have been from time to time made by candidates for the services to the effect that, whilst the ophthalmic surgeon has regarded them as fulfilling the conditions required in the regulation of such service, they have been rejected by the official examiners for their defective vision. Of course, other causes for rejection besides eyesight may have operated in some instances, but it cannot be doubted that a candidate would certainly give a better result when examined by an ophthalmic surgeon under favourable conditions as regards light than he would do on a dull afternoon in November or December when tested in the ordinary way. Hitherto, however, no precise or scientific observations are before the profession, and Professor Snellen has done well to select it as

a very important and practical point to form the subject of the biennially recurring lecture established by the Ophthalmological Society in honour of one of its founders and greatest benefactors, Sir William Bowman. The illumination employed by Professor Snellen was that of a gas flame under carefully regulated pressure which had been passed over benzene and which possessed an illuminating power of from thirty to fifty candles at the distance of one metre. It was found that whilst after a certain degree of intensity is reached, amounting to about fifty metre candles, the unprotected eye is unable to recognise any further increase of luminosity, a decrease as well as changes in intensity are readily perceived. The nature of the occupation which is followed by the person whose eyes are under examination has, of course, an important bearing on the amount of light required. Thus whilst the work of compositors was found to be interfered with when the light fell below fifteen metre candles, that of blacksmiths or carpenters could still be continued with an illumination of ten metre candles. The importance of securing good and constant light in all examinations of the eyes in which their powers are tested is evident from these investigations, and we are indebted to Professor Snellen for the care and attention he has devoted to this subject and for the precision of the results he has obtained.

THE MODERN DECORATION OF LADIES' HATS.

SENTIMENT is a very variable quantity in the human mind: some have none, many have too much, and a few possess a mind evenly enough balanced not to be led away by an abnormal enthusiasm and yet to protest against any unnecessary suffering which is inflicted on animals. The correspondence which has taken place lately in the *Times* has again brought before the public the sale of feathers for ladies' hats. The feathers of the osprey have been specially mentioned, as it appears that the real article is often sold as an artificial one, so that all qualms of the purchaser may be set at rest. In such cases the buyer is scarcely to blame, but we ask those who are in the habit of buying these ornaments to do without them if possible. We are told that in order to obtain these particular plumes the parent birds have to be killed *during the breeding season* and the result is that all the young birds die of starvation. It is often difficult to realise suffering which is not seen, but we feel sure that if the ladies who wear feathers only think of the wholesale destruction of bird life which takes place they will abstain from buying them in the future. So long as there is a demand there will be a supply; but once let the practice "go out of fashion" and we shall cease to hear of such cruelties as killing the old birds and leaving the young to starve.

WORD-DEAFNESS AND DEPRESSED FRACTURE.

IN the *American Medical News* Dr. J. T. Eskridge records a case in which mind-deafness and word-deafness were the result of a blow on the head, followed by fracture of the skull and subcortical hæmorrhage. The patient, aged twenty-three, was a native of Bohemia, in which country he had lived until he went to the United States at the age of thirteen. After arriving there he attended school and spoke English fluently. He was hit above the left ear with either the butt of a revolver or with a coupling-pin and fell to the ground. He was admitted to hospital a few hours later in a dazed and confused condition, but he answered questions in English slowly but intelligently. The next morning he was able to give some details of his injury, but in the afternoon he ceased to be able to speak in English, and only uttered disconnected words and meaningless phrases in the Bohemian dialect. It was at this stage that Dr. Eskridge first saw him. His temperature was about 99° F., the pulse was 60, and the respiration was 18 and regular. There was no paralysis, the reflexes were not materially altered, and the fundi oculorum were normal. When spoken to he seemed to hear and would answer in Bohemian or English, using words entirely irrelevant, and he was apparently unable to recognise objects. Operation was resorted to at once, the lesion being supposed to be situated in the left temporo-sphenoidal lobe. A depressed fracture was found with the bone lying against these convolutions, but there was no extravasation of blood and it was supposed that there was no other lesion. The speech disturbance, however, did not improve. A few days later general convulsions began. Dr. Parkhill resolved to re-open the wound. The dura mater was exposed and was found covered with recent exudation. This was scraped away. Still the pulsation of the brain seemed less than it should be and the brain substance was incised and masses of dark, partially clotted blood were cleared out. Improvement soon followed and the mind-deafness soon disappeared. The word-deafness, however, remained for at least three weeks longer, but ultimately recovery was complete. One point is of interest—viz., that as he recovered, his failure of memory for his Bohemian mother tongue persisted longer than that for his acquired English. During his delirious state he spoke almost exclusively Bohemian, and as this began to subside English was substituted. It was not until several days after recovery appeared to be complete that he volunteered the information concerning the difficulty experienced in thinking in his mother tongue. But during the five years he had spent in Colorado he had little or no occasion to speak Bohemian, and in the previous years in the United States he had spoken only Bohemian at home, and English at school and with his playmates. Dr. Eskridge then explains the apparent peculiarity. In his normal condition he could talk best in the language which he used most—that language which he had employed almost exclusively for a number of years. In his delirious state the cells reproduced the impressions made upon them when they were most impressionable and Bohemian was the language employed. After this had passed off he was left weak, and voluntary recollection was best for those things with which he was most familiar at the time.

FENCING: AN ELECTRIC SCORER.

A GOOD many members of the profession interested in fencing were present on Wednesday, the 24th ult., at the fencing rooms of the veteran Mr. Bertrand, in Warwick-street, to witness a competition which was decided by means of the Electric "Umpire," the invention of Mr. Muirhead Little, F.R.C.S Eng. The object of the invention was to overcome the well-known difficulty of judging hits. This difficulty is so great and general that in Paris it is said that disputes are the rule and not the exception in public competitions. The end in view has been achieved by covering the front of each jacket with fine copper or brass wire gauze and connecting this with the adversary's foil and an electric bell (of the burglar alarm pattern) and battery in the same circuit. It follows that when a hit is made the circuit is closed and the bell rings and continues to ring until stopped by the person in charge. A special arrangement in each foil-handle provides that only a direct point produces a ring. Two entirely electrically distinct circuits are used, each including a bell, foil, and jacket; flicks, or blows, or grazes produce no result. The bells being of different tones and moreover placed on opposite sides of the room, there is no difficulty in deciding who has scored a hit, or in cases of almost simultaneous hits who delivered the point first. By a very simple arrangement the wires passing from the batteries to the combatants' collars are kept well out of the way however sudden may be their movements of advance or retreat. Six selected amateurs

competed for a pair of foils, and five bouts were fought. The trial was completely successful and the spectators expressed themselves as well pleased with the result. The well-known swordsman Captain Hutton, who was present, congratulated Mr. Little on the success of his invention and said in thanking him for giving him and others the opportunity of seeing it, that it would be of great value at such competitions as the Royal Military Tournament, for the best judges made mistakes, while the electric current could not err. Captain Hutton afterwards tried the apparatus on his own person in a bout with the foils, and testified to the complete absence of any restraint on his movements when using it.

THE LATE DR. C. H. RALFE.

THE recent announcement of the retirement of Dr. Ralfe from the acting staff of the London Hospital and of his election to the office of consulting physician must have been to many of his friends the first intimation that his health was failing. For he was ever a strenuous worker and devoted to his profession, and with him retirement from hospital practice meant more than it frequently does. We must defer till next week any adequate notice of his life, and content ourselves to-day with an expression of our sorrow for his death, which has deprived THE LANCET of one of its best friends and contributors. It is fully twenty-five years since Dr. Ralfe first commenced to write in this journal, and many a valuable contribution in our leading columns, in the reports of Commissions, and in literary reviews, came from his pen. His published works, particularly the monograph on Diseases of the Kidney—a department in which he was an acknowledged authority—are sound and scientific, whilst his full knowledge of chemistry enabled him to make many contributions to physiological and pathological chemistry which are permanent acquisitions to medicine. As an instance may be cited his study of Scurvy, which originally appeared in THE LANCET, and was an admirable exposition of the *rationale* of the blood changes in that affection. In him we mourn a loyal and genial colleague, and the profession loses one of its most devoted members.

PROPOSED LUNACY REFORMS.

MR. CHARLES HENEAGE has sent us a copy of a letter which he has addressed to the Lord Chancellor and other Ministers drawing their attention to reforms in lunacy administration which are desirable. He first of all advocates the re-organisation and strengthening of the Lunacy Commission. Secondly, he urges the importance of what he terms "Psychiatric Institutions" under State control, to which all cases should be admitted in the first instance. He thinks that their civil rights would not be affected by a stay in such an institution, that the condition of a patient's health could be fully investigated and that the early stages of mental disturbance could be easily checked and cured. This is rather a sanguine view, but one of the chief advantages of the institutions would be the opportunities given for the study of mental disease by those who are intending to devote themselves to asylum work, and by students and practitioners in general. At present, the junior medical officers at asylums have had little or no training specially bearing on mental diseases, and the scientific work done in those institutions falls very much short of what might be accomplished. The idea of a central institution of the kind proposed by Mr. Heneage is not new. Mr. Brudenell Carter brought forward a similar scheme in the London County Council in 1889, and a committee inquired into it, but there was anything but unanimity among the medical experts who were called, and the project unfortunately was not carried out, although there was a general feeling in favour of some arrangement of the kind. Mr. Heneage's other proposals for legislation for habitual drunkards and for the adoption of a workable scheme analogous to the Austrian "Curatel" system for controlling the property of the insane and habitually intemperate have often been referred to in these columns with approval. Although Mr. Heneage's suggestions are both reasonable and desirable they are too general, and he will do well to get the assistance of those having practical, medical, and legal acquaintance with the subject to draw up detailed plans for carrying them into effect in a form in which they can be profitably discussed.

THE FRENCH SURGICAL ASSOCIATION.

THE tenth congress of the French Surgical Association will meet at the Faculty of Medicine in Paris on Monday, Oct. 19th, 1896. Professor Terrier, member of the Academy of Medicine, will preside, and the proceedings will commence at 2 P.M. Two subjects have been selected for discussion at the Congress—the Surgical Treatment of Club-foot, introduced by Mons. Forgue of Montpellier; and the Treatment of Prolapse occurring in the Genital Tract, introduced by Mons. Bouilly of Paris. The names of papers intended to be read, together with a summary, should be sent by Aug. 15th at latest to the general secretary, Mons. Lucien Picqué, Rue de l'Isly, 8, Paris.

AN IMPOSSIBLE JUMP.

MR. J. RITCHIE of Royal Aquarium renown has, like the late Mr. Barnum, earned world-wide fame by introducing into his "shows" objects of the "greatest on-earth" kind. His latest movement in this direction was the startling announcement that a lady would jump from a hollow wooden tower 40 ft. above the dome of the Royal Aquarium on to the solid ground below, a distance of 150 ft. Such a jump without a fatal result, we need not remind our readers, is physically impossible, yet the jump (?) was successfully accomplished on Saturday night last amidst a series of cheers and hisses. This latter kind of reception we were pleased to hear, because it is a healthy sign that the public are beginning to disapprove of exhibitions which are dangerous to life and limb. The risk, however, in the present case is little more than, if as much as, the risk which attaches to rope-walking and trapeze performances. Without divulging the secret, which is perfectly obvious to those in a favoured position, we would suggest that the manager of the illusion—for practically it is nothing more—should take a few lessons from some master of the prestidigitateur's art, who would perhaps be able to show him how to more effectively disguise the mechanism.

THE LACK OF PUBLIC MORTUARIES.

THE question of public mortuaries has been for some time a crying one, but is to-day brought forcibly before us by reports received from widely separated parts of the country—namely, Brixton, Littlehampton, and Tividale. To be sure there is a mortuary at the last-named place, but with the extraordinary fatuity which characterises many public bodies the authorities have placed it in, or at, the infectious diseases hospital, a place absolutely unsuitable we should say for the purpose so long as the practice of the jury "viewing the body" is kept up. This was all very well in the old days; when there were no legally qualified medical men the "viewers" by their action gave a sort of certificate of death. But now that there exists a body of men charged by the State with the responsible duty of certifying either the fact of death or the fact that someone told them that death had occurred, which, by the way, is no evidence, the gazing at a body by twelve men selected at haphazard is a foolish and unmeaning bit of ritual. The Brixton post-mortem examination was held in the house where the subject of it had died, and the one at

Littlehampton presumably in a private house too. Now this sort of thing is intolerable. Besides the danger to the health of the community there is the total absence of reverence to the dead and the risk of hurting the feelings of the living when post-mortem examinations have to be held, or the body has to await burial, in a mere shed. A tithe of the money now squandered upon ministering to the fads of "educationists," to use their own phrase, would supply decent, well-found mortuaries for the whole of London at any rate.

TESTIMONIAL TO SIR WILLIAM BROADBENT.

IT has been decided to raise a fund for the purpose of presenting Sir William Broadbent with a testimonial on his retirement from the post of senior physician to St. Mary's Hospital, in recognition of the valuable services that he has rendered to the hospital and medical school, and of the distinguished position that he holds in the medical profession. Subscriptions, which are not to exceed two guineas, may be sent and cheques and postal orders be made payable to the order of Mr. Malcolm Morris, 8, Harley-street, Cavendish-square, W., treasurer to the fund.

GRAND FÊTE AT MIDDLESEX HOSPITAL.

A MOST successful *fête* was held on Wednesday last at the Middlesex Hospital to celebrate the opening of the new convalescent home at Clacton-on-Sea, which provides accommodation for twenty-six men, seventeen women, and twelve children, and also for nurses who from sickness or other causes require rest and change of air. The proceedings were inaugurated by the Duke and Duchess of York, who were received by the executive committees and guards of honour composed of the Middlesex Yeomanry Cavalry and the Volunteer Medical Staff Corps. A presentation of purses to the Duchess then took place, and after this their Royal Highnesses visited various parts of the hospital and attended a concert which was being held. Among the many forms of entertainment provided for the visitors were concerts, exhibitions of pictures, Roentgen rays and the kinematograph, and besides these there were various exhibitions connected with hospital work, of which one of the principal was the model ward, which showed the general arrangements of a hospital ward and various technicalities connected with it. The garden was beautifully decorated with flowers and very prettily illuminated at night, and the proceedings were enlivened by the band of the Royal Engineers. We are glad to be able to state that over £4500 have been collected, and we heartily wish the new undertaking a complete success.

AN IMPORTANT ACTION UNDER THE DENTISTS ACT.

UNDER the auspices of the British Dental Association a successful prosecution has lately been carried out which tends to show that Section 3 of the Dentists Act is far more embracing in its reading than is generally supposed. In the case in question the person was prosecuted for not being duly registered either as a dentist or a medical man and with using the letters D.D.S., implying that he was so. Evidence was given in support of the prosecution, the defence taking the line "that the Act was passed for the protection of the public and not for the protection of registered dentists." The Bench, however, found that the prosecutors had made out their case and so fined the defendant £5 and costs. Notice of appeal has, however, been given. The main point of interest in the above case lies in the fact that the use of such titles as D.D.S., &c., which are unregisterable in Great Britain by unregistered dentists is a contravention of the Act. This is a point of the greatest importance. The words of the defence that the Act was framed to protect the public and not the registered practitioners are in perfect accord with our own views, but it must be remembered that the only certificate the public have that people are qualified and fit to practise is the presence of their names in the register, but what guide have the public to the skill and knowledge of those whose names do not appear in that list? The Act, therefore, by enforcing that a person to legally practise dentistry shall be registered protects the public in the best possible manner.

GENERAL MEDICAL COUNCIL: ELECTION OF DIRECT REPRESENTATIVES, 1896.

A MEETING of the medical profession will be held on July 16th at the Royal Medical and Chirurgical Society's rooms, 20, Hanover-square, W., at 5 P.M., to hear addresses from Dr. J. G. Glover, one of the present representatives, who offers himself again for election; Dr. Woodcock, J.P., of Manchester, and Dr. Lovell Drage of Hatfield, who are candidates nominated by large and influential committees for the seats resigned by Mr. Wheelhouse and Sir W. Foster, M.P. Dr. Wallace, President-elect of the Metropolitan Counties Branch of the British Medical Association, will take the chair.

TRANSPLANTATION OF TEETH.

WE have often commented on the subject of transplantation, replantation, and implantation of teeth, so the following successful case of transplantation may be of interest. Mr. Scott Thomson, in a communication to the *Journal of the British Dental Association*, says:—

"In December, 1874, I extracted two upper lateral incisors from the mouth of a boy in order to relieve an overcrowded state of the teeth. These were inserted in about half an hour into sockets of similar teeth removed from the mother for caries. The importance of removing the pulps of transplanted teeth was not at that time recognised and was not carried out in this case. Twelve months subsequently an alveolar abscess occurred in connexion with the left lateral incisor, which rapidly subsided under treatment by drilling a 'vent' and bread poultices. I saw this patient quite recently, that is more than twenty-one years after the operation, and these teeth are still *in situ*, and although somewhat loose are in as good a condition as the rest of her teeth. The right lateral is distinctly sensitive to thermal changes. Can the pulp be still alive?"

It would appear that transplantation, or "ingrafting" as was called, of teeth (first introduced, we believe, by Hunter), has never gone out of practice. In Miss Morse Earle's "Customs and Fashions in Old New England" is quoted an advertisement from the Massachussets *Centinal*: "Live Teeth.—Those persons inclined to dispose of live teeth may apply to Templeman." And again from the Connecticut *Courant* of Aug. 17th, 1795: "A generous price paid for human front teeth perfectly sound by Dr. Skinner."[1]

"HOSPITAL SCANDALS."

IT is a curious thing that the public are so eager to rejoice over any misforture that may happen to a hospital and it is still more curious that the daily press should encourage it even for the sake of selling a few extra copies. The late "Hospital Scandal at Poplar" is a case in point. Here a woman was brought in at 2 o'clock one morning and attended to at once. Every bed in the hospital was full and as in the house surgeon's opinion there were no signs of collapse the woman was carefully wrapped up in blankets and provided with hot-water bottles and sent in a proper covered ambulance to the Sick Asylum, the distance to which from the hospital can be covered within fifteen minutes. As it happened the woman died, and, although

[1] Alice Morse Earle: Customs and Fashions in Old New England, p. 305.

she may possibly have been in a worse condition than the house surgeon thought she was, he acted carefully and to the best of his ability, and it is a monstrous shame that such unreasonable views of any mishap should be taken. The hospitals only ask for just criticism; the individuals who do the work there are human and are sometimes liable to make mistakes like the rest of us, and when those mistakes occur the authors of them have a right to expect justice. Perhaps it is too much to expect a fair view of such things to be taken while "A Hospital Scandal" on the placard of an evening paper may result in a substantial increase of the circulation; and what does it matter if a few house surgeons and nurses have a little injustice done them? To be logical the papers might publish some of the good results that come out of hospitals, for probably the worst enemies of these institutions will acknowledge that occasionally people obtain a little benefit from them. There are peculiar difficulties in the duties of house surgeons. Their responsibilities are very great, and when we think of the thousands of cases in which they have to decide whether the patient is fit to leave or not we can only admire the judgment and care which result in so few mistakes.

HEALTH IN THE POST OFFICE SERVICE.

THE following resolution, which was unanimously carried at the recent conference of the Postal Telegraph Clerks Association, deserves the serious attention of the authorities:—

"This Conference expresses its regret that the immense and invaluable opportunities afforded for the collection of reliable statistical information relating to many important questions in economic science and public health which are afforded by the large bodies of men and women employed by the Post Office are not utilised, and urges upon the Postmaster-General the desirability of taking steps towards the collection and periodical publication of statistical information relating to postal employés, which shall be easily accessible and readily comparable with the statistical information now collected and tabulated by the Board of Trade, the Registrar-General's, and other public departments."

It is a reproach to an important Government department like the General Post Office that such a resolution could be framed, and the sooner a Government department which employs some 140,000 men and women remedies the existing state of things the better. By its action the Post Office is robbing the country of valuable information which is readily supplied by other departments, and this in spite of recognised medical opinion. We sincerely trust that the resolution will be acted upon.

POLITICS IN MEDICINE.

"THE cup of sorrow has been brimming over for some time and it is now nearly full." This pathetic sentence applied in the House of Commons by a member of one Celtic community to his country may well be applied to another when we read in a Welsh paper: "Haverfordwest has one medical man to each thousand inhabitants, and, strange to say, each doctor—there are six in all—is a Tory. There should be a good opening there for a Radical man of medicine." Are politics and medicine so interdependent? Of course, as Herbert Spencer has shown with great clearness, medicine and the priesthood went at one time hand in hand, so naturally a medical man bears the interior instinct of Toryism. The essence of good medicine is not to be meddlesome, not to upset existing institutions so long as they work well, and, as the old Greek physician said long ago, to do no harm even if you can do no good, whereas Radicalism——but we are a non-political journal. Diseases, it is well known, flourish on a virgin soil, and if Haverfordwest would afford so good an opening for a Radical medical man we would pray the hypothetical Radical not to keep it all for himself. Let him remember the claims of Faith-healers, Christian Scientists, Undenominational Educationists, Anti-this, that, and the other 'ists, women and men who did or not, Little Englanders, Rebeccaites, the persons—if there are any left—who believe the earth is flat, Peculiar People, people who having no business of their own are kind enough to look after other people's for them, &c. There should be an opening for all of these, and what a happy place Haverfordwest would be. Mr. Harold Frederic has recently given as a definition of hell that it is a place where everyone has to mind his own business. If this be so, Haverfordwest would become by adopting our advice a very Heaven.

THE METROPOLITAN PROVIDENT MEDICAL ASSOCIATION.

IT is impossible not to feel a certain sympathy and even admiration for the way in which the committee, especially Mr. Claude Montefiore and Mr. Bousfield, of this association work at the problem of providing medical attendance for classes, not paupers or persons able to pay the ordinary fees of respectable medical practitioners, but for the great numbers between these extremes. The success has been considerable, including nineteen dispensaries, of which ten are self-supporting, 35,000 members contributing nearly £5000 a year in periodical payments. They profess to encourage thrift, to supply good medical treatment, and to deal fairly with the medical profession. THE LANCET has occasionally been the medium of complaint that this association permits canvassing and the advertising of the names of its medical officers. We have been at some pains to ascertain the facts, and we are informed that while collectors have to be employed in certain places, who sometimes obtain new members, the collectors are specially instructed not to interfere in any way with the private patients of medical men or with working people who subscribe already to clubs having a medical officer. This instruction should be very explicit, and the breach of it should be followed by the dismissal of the collector. The names of all respectable practitioners are accepted in these dispensaries. The rules involve a wage-limit of 30*s.* or in the case of a family 40*s.* per week. The total receipts, including grants from Hospital Sunday, donations, subscriptions, &c., and provident members' payments, are £6079 16*s.* 8*d.* The expenditure is about the same. The medical staff and dentists get only £2679 13*s.* 6*d.* The collectors, secretary, dispenser, &c., get £1203 5*s.* 11*d.* Though the remuneration of the medical staff is inadequate, they are duly represented on the committee and their pay is a first charge on the funds. The promotors of these dispensaries have one great claim to the gratitude of medical men—they are amongst the chief advocates of reform in the out-patient department, and place their dispensaries at the service of the hospitals for this end.

THE ABUSE OF HOSPITAL RELIEF.

"A LONDON PARSON," who writes to the *Saturday Review* upon the subject of hospital relief and its demoralising effect upon certain of the poorer classes of society, has drawn attention to a serious mischief and happily illustrated its effects. He tells, for instance, of an "advanced progressive lady whose husband is a painter," and whose view it is that the working man "keeps up the hospitals through indirect taxation," and of another of his parishioners "who keeps a banking account, owns three houses, and whose occupation brings him in £80 a year," but who, nevertheless, does not think it beneath him to send his wife to the hospital. That such a state of feeling should exist is much to be regretted, and the most regrettable feature about it is that it is not wholly or only bad. The niggardliness of the man is very possibly a habit contracted long before the banking account had any existence, and the woman's misapprehension may be safely enough attributed to the working in her mind of

undigested ideas. Both the calculating temper and the inquiring mind may be meritorious in due time and place, but it is unfortunate when they militate against a good cause. It cannot be too clearly stated or too widely known that every person who improperly benefits by hospital relief is thrusting aside some other applicant whose necessity is greater, and that the hospitals of London, far from being in any sense rate-supported institutions, derive their funds wholly from spontaneous charity—a charity which cannot, indeed, be attributed exclusively to any one class in the community, but with regard to which, if any discrimination must be made, it may be conjectured that the wage-earning classes, as a whole, do not contribute in due proportion to their number or their means, nor, again, to the benefits which they derive from the existence and work of the hospitals.

As numerous inquiries are addressed to the Colonial Office regarding the identity and Christian names of settlers and troopers murdered or killed in Mashonaland and Matabeleland, it should be known that all information telegraphed to the Colonial Office regarding individuals is at once communicated to the Press, and the department is not in possession of any information of this kind which is not available to the public. The High Commissioner for South Africa has been instructed to ask Sir F. Carrington to supply the Christian names if possible.

THE Midsummer meeting of the Abernethian Society will take the form of a Jenner Centenary Commemoration. Dr. Gee will deliver the address at 8 P.M. on Thursday, July 9th, in the medical theatre of St. Bartholomew's Hospital, his subject being "The Conflict of Medicine with the Small-pox." Refreshments will be served afterwards in the library. All members and their friends are invited to attend.

THE Prince of Wales has presented Dr. Isambard Owen with a signed copy of his portrait in Chancellor's robes in recognition of the success of the installation ceremony at Aberystwith on the 26th ult.

THE sixty-fourth annual meeting of the British Medical Association will be held at Carlisle on Tuesday, Wednesday, Thursday, and Friday, the last four days of July, 1896.

THE annual dinner of the British Laryngological, Rhinological, and Otological Association will be held at the Langham Hotel on Friday, July 17th, at 7.30 P.M.

THE subscriptions to the Metropolitan Hospital Sunday Fund now amount to over £38,000. We shall continue our publication of the details next week.

DR. ROBERT BARNES has been elected a Fellow of the Linnean Society.

PRESENTATIONS TO MEDICAL PRACTITIONERS.—Mr. James Stothard, M.R.C.S. Eng, of Hull, has received from the members of the Albert Dock Ambulance Class, Hull, a silver-mounted umbrella, with name engraved, as a mark of respect and appreciation for his past services as their instructor.—Dr. Henry Smith of Durham has been the recipient, from the ambulance class in connexion with the St. John Ambulance Association held at the Durham station of the North-Eastern Railway, of a silver claret jug and salver in recognition of his instruction on first aid.—Miss Catherine M. Wickham, L.R.C.P. and S. Edin., has been presented by the members of the ambulance classes held at the Honor Club, Fitzroy-square, in connexion with the St. John Ambulance Association, with a gold pencil case and seal as a token of appreciation of her services as their lecturer.

Pharmacology and Therapeutics.

HYPODERMIC USE OF IRON.

DR. DA COSTA, in the *Therapeutic Gazette*, gives an account of the hypodermic use of iron, and it seems that this method of administering this important drug should have its useful place in such cases where iron would be beneficial but where there is some objection to giving it in the usual way by the mouth. The preparation recommended for this form of administration is the ferrous manganese citrate, which is stable and has not the irritating qualities of many other compounds. The directions given for preparing the solution are to powder the crystals in a mortar and gradually dissolve them in hot distilled water in the proportion of one grain of the crystals to five minims of water. The usual dose for an adult is fifteen minims, representing three grains of the compound salt. Strict antiseptic precautions must of course be taken to prevent any infection taking place. Iron given in this manner gets very rapidly into the circulation, and on this account the dose to begin with should not be more than half of that given by the mouth. The effect on the nervous system is said to be strengthening, and Dr. Da Costa has seen no ill effects from it though in some cases sneezing, nausea, vomiting, and even delirium have been described as occurring after large doses. The special indications for giving the drug in this way are said to be in those cases where a rapid action is needed, as after severe hæmorrhage, and in those people who have such delicate digestions that they cannot assimilate the iron when given by the mouth, but quickly improve when it is given hypodermically.

THYROID GLAND IN SKIN AFFECTIONS.

Since the discovery of the therapeutic effects of the thyroid gland in myxœdema it has been extensively tried in other diseases with varying results, but seems to have effectually established itself as a valuable agent in certain affections of the skin and the disease which it most successfully combats is lupus. Many cases which have lasted for years and have been subjected to every kind of treatment improve wonderfully under the influence of thyroid gland. The nodules tend to disappear and a thin, superficial scarring takes the place of the diseased tissue. Whether the effect is really permanent or temporary time alone and reports of cases which have been carefully watched over prolonged periods can prove, but it is certain that in very many cases there is much temporary benefit obtained. The difficulty in prescribing it for any length of time is on account of the well-known constitutional effects which the gland may produce, and this often necessitates a break in the treatment, even though a local improvement is taking place. Thyroid gland is said to be beneficial in some cases of psoriasis and eczema, but results in these diseases have not on the whole been very satisfactory.

DIET IN EPILEPSY.

Dr. Haig contributes an article in the spring number of *Brain* which deals with the effects of diet and drugs on epilepsy, which, he thinks, are due to the differences they produce in the excretion of uric acid. Dieting in epilepsy is an old therapeutic measure which has probably often a distinct influence in individual cases depending on various idiosyncrasies of which we know little; although it must be confessed that some authorities have met with people in whom a strict diet seemed to increase the number of fits. The object of this mode of treatment is to cut off nitrogenous food, and so to limit the amount of uric acid in the system, and Dr. Haig thinks that this treatment has been a failure only because it has not been carried far enough, and he quotes various cases which show how many uric-acid-forming compounds may be overlooked in a diet which at first sight appears to contain very few. Without going so far as to believe that uric acid and epilepsy are in such direct relations as cause and effect, which is the view Dr. Haig holds, it is still conceivable that in predisposed persons an excess of uric acid in the system might act as the exciting cause, and so, therefore, in many cases it might be worth while to try the effect of such a strict diet as Dr. Haig advocates in the hope of at any rate diminishing the number of fits.

THOMAS WAKLEY,

THE FOUNDER OF "THE LANCET."

A BIOGRAPHY.[1]

CHAPTER XXVI.

Wakley's Aim in Entering Parliament.—The Amendments to the Apothecaries Act.—A "Member for Medicine."—The Borough of Finsbury.—Wakley's Claims as a Candidate.—The Invitation of his Constituents.

WAKLEY'S aim in entering Parliament was very definite. At a time when all around was reforming itself or being reformed, when the word "Radical" was for the first time attached collectively to the more progressive groups of English politicians because of their constant and common demand for radical reform in one direction or another, Wakley desired to represent the interests of his profession in Parliament and to press there for reform in medical politics. Over and over again in his war against the constituted authorities of the professional world, in his conflicts with the College of Surgeons, and in his attempts to break down the barriers of secrecy erected by the administrators of the hospitals to screen their work, he had felt the need for a strong friend within the walls of Parliament House. The great English corporations had many such friends. Sir Henry Halford and Sir Astley Cooper were powers in the social world whose influence could always be brought to bear upon political questions and whose persons were familiar to many legislators. When the Members of the College of Surgeons presented their petition to the House of Commons it was received without enthusiasm, almost without comment, and no attempt was ever made to inquire into the justice of their demands. This apathy on the part of the House Wakley considered to have been directly due to the private representations of the impeached corporation. He believed that the College of Surgeons had been able to catch the ears of individual members of the Government, and his grounds for the belief were very sound. He desired, therefore, that some one with real knowledge of the needs of the medical profession should be in Parliament to prevent such petitions being brushed aside contemptuously. Rating the influence of a private member very high he thought that if a well-informed man could give the legislature the benefit of his experience on medical topics from the advantageous standpoint of being himself a legislator the assistance would receive respectful attention, while a few well-timed words from such a man would show up manœuvres similar to those by which the cause of medical reform had been recently strangled. Wakley perceived that it was imminent that other medical questions would find their way into the House. Reform was the order of the day all round, and the constitutional agitation that was spreading far and wide in opposition to authorities or privileges having no better reason for their existence than the prestige of history was certain not to stop at one petition against the ruling body of one corporation. He felt that the movement represented by that petition was gaining in strength, and inasmuch as the possessors of power do not usually resign their positions upon moral conviction, but generally await the legal curtailment of their privileges—this being the first thing, as a rule, to bring moral conviction into play—he foresaw that the House of Commons must be the ultimate scene of the adjustment of many disputes involving the rights of the medical man.

The Apothecaries' Act of 1815, for example, was to be amended, greatly to the disgust of the Master and Wardens of the Worshipful Company, who were straining every nerve to resist projects of reform which would interfere with their valuable warrant to dispense medicines and to prevent other persons from doing so. The rights and wrongs of the questions here raised must have been absolutely unintelligible to the lay member of Parliament. The Apothecaries' Act of 1815 created a large class of general practitioners in England who had a monopoly of dispensing and could if they chose enforce their privileges against duly qualified practitioners not belonging to their Society. Yet many of the Licentiates of the Society desired the Act to be amended, and one of the reasons given by them for this was that under an amended Act the status of the English general practitioners would be raised and they would thus be better able to resist the very general invasion of the country by graduates of the Scotch Universities. On the other hand, a larger number of the Licentiates joined the officers of the Society in protesting against the abolition of their privileges, and one of the reasons which they gave for desiring to remain in their present estate was that the Society by exercising a monopoly in England and Wales of the right to carry on the business of apothecaries, was able to fine and otherwise harry the Scotch interloper back to his country. And this view at first sight would seem to be sound because the Scotch medical corporations petitioned Government urgently in favour of the amending of the Apothecaries Act, clearly believing that their country had more to gain under the new proposals than under the old charter. Here was a coil! In the matter of an ancient society persons who were not within its fold asked for its reform, while persons who were within could not agree among themselves whether it ought to be reformed or no, the two parties differing entirely as to what they wanted while each used the same argument to enforce their views. Wakley had the whole matter at his fingers' ends and only desired to expound it to the Legislature, his feeling being that the country as well as the House ought to be properly informed on such points or injustice would be done. Questions arising out of the existing Poor-law, out of the State regulation of the study of anatomy, and out of the acknowledged abuses existent in the administration of the law in coroners' courts were also engaging the attention of Parliament at the time, and in every case the Editor of THE LANCET felt that the medical profession needed someone within the House to make medical matters, often of a severely technical kind, clear to the comprehension of the legislators.

That was his single aim in desiring to enter the House—to further the cause of medical reform, to be an expert witness ready to hand whenever a point arose in the deliberations of the House where the views of one thoroughly experienced in medical matters might be valuable. He was not without the exaltation that every man must feel within his breast on attaining a position entitling him to hope for a voice in the government of his country. Wakley was, on the contrary, an ambitious man, and to sit in the mother of Parliaments had for him, being young and the architect of his own fortunes, a promise of pleasure that it would not have had either for one grown grey beneath the worries of public life or for one born in a social sphere where a seat in the House of Commons was but a due appanage to hereditary position. But the cause of medical reform was the cause that he intended to advocate there if he could obtain the suffrages of his fellow citizens.

It is not sufficient, however, for a young man to have a call to politics, as a revivalist preacher has a call to a pulpit, to justify him in attempting to obtain a seat in the House

[1] Chapters I., II., III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV., XVI., XVII., XVIII., XIX., XX., XXI., XXII., XXIII., XXIV., and XXV. were published in THE LANCET, Jan. 4th, 11th, 18th, and 25th, Feb. 1st, 8th, 15th, 22nd, and 29th, March 7th, 14th, 21st, and 28th, April 4th, 11th, 18th, and 25th, May 2nd, 16th, 23rd, 30th, June 6th, 13th, 20th, and 27th respectively.

of Commons, and had Wakley offered himself as a political candidate for Finsbury solely on the ground that he felt within himself the capability of being useful to his generation because of his professional knowledge he would have been wrong and also unsuccessful. If he had acted upon his own initiative his opponents would have been able to say: "Granted that the House is sorely in want of a 'Member for Medicine,' a member who shall at all times and seasons be watchful over the best interests of the profession, a member who shall keep the House in touch with the true trend of feeling in the profession and help it to discriminate between the real hardship and the hardship that only looks real in a petition—granted all that, but who says that you are the man for the post? Who says that you are right in claiming for yourself this proud and representative position?" And had Wakley come forward and invited suffrages as the "Member for Medicine" such questions would have been very hard for him to answer. Clearly he could not claim to represent the whole profession when he was at personal war with many of the leaders and untiring in his criticisms of the charters by which the different corporations were ruled. He would have had to explain that the powerful individuals and wealthy societies on whose methods or morals he had felt it his duty to comment severely in his paper were already represented in Parliament, being in a position to make their views known to members of the House, while it was the interests of the profession at large that required protection, which interests he desired to represent. It would have been a fair answer, but not a very conclusive one, so that it is fortunate that Wakley never placed himself in a position where he would have been compelled to make it by claiming to be the "Member for Medicine." It was his aim to promote medical reform in Parliament and it was on account of the work in that direction that he had already done, and that he proposed to do, that he felt his political aspirations to be reasonable; but he saw from the beginning that no such simple electoral cry as "Justice for Doctors" would secure him a seat. There was no constituency in England then, and there is not one now, where the personalities of the medical men or the importance of the medical interests are so predominant as to warrant a candidate asking for a seat to represent them. Wakley stood for Finsbury at the first election after the great Reform Bill as an advocate of advanced reformed principles, as the supporter of all schemes for the amelioration of the condition of the people, and as the avowed enemy of all monopolies, religious disabilities, and protectionist tariffs on the nation's daily food—a comprehensive, if somewhat vague, programme.

The newly-constituted borough of Finsbury comprised the whole of the thickly-populated district extending from Seven Dials in the south-west to Stoke Newington in the north-east. It included nearly all the parish of St. James's, Clerkenwell, the parishes of Stoke Newington, Islington, St. Luke, St. George-the-Martyr, St. Giles-in-the-Fields, and St. George's, Bloomsbury; the liberties of Saffron-hill, Hatton-garden, Ely Rents, the Rolls, and the Charterhouse; Lincoln's-inn, Gray's-inn, and those parts of the parishes of St. Sepulchre and St. Andrew's, Holborn, and of Furnival's-inn and Staple-inn respectively which were without the liberty of the City of London. The approximate population of this, one of the largest of the boroughs called into existence by the Reform Bill, was 330,000, and it was regarded as among the most important of the metropolitan seats. To this enormous constituency Wakley had become favourably known during his four years' residence in Bedford-square. His work in THE LANCET as a medical reformer had attracted the attention of all classes. He was recognised as a man who had fought the monopolists of his own profession with unflinching courage and great success. He had established a reputation as a public speaker not only at the meetings held in advocacy of the cause of medical reform, but at the poll for the office of coroner for Middlesex, a post for which he was a candidate in 1830 under circumstances that will be described later. Here he became known to the general public for the first time as an orator, as one who possessed the magic power of holding a large audience, of carrying it with him in his sentiments and of playing with its finer feelings while dominating its coarser. Finally Wakley was selected by Joseph Hume and William Cobbett as a proper person to fill a seat in the first Reform Parliament, and each of his supporters had a right to speak on the subject with authority. Hume, the member for Middlesex, had been a consistent Liberal and exponent of reform principles for fifteen years in the House and was regarded by the public as a Parliamentary leader in the fight for an extended and purified franchise that had just been won. Cobbett was general of the popular forces without the walls of Westminster, his vigorous, clear, unscrupulous pen having contributed more to the bloodless revolution of 1832 than any one man's individual efforts. He popularised each step, making it comprehensible by the clarity of his language, and reasonable by the convincing strength of his arguments and sent to the poll voters by the thousand educated to understand their new privilege.

It was natural that Cobbett, who, on the passing of the Reform Bill became a political power, should think of Wakley as a man for whom a seat must be found in Parliament. He had known him intimately for twelve years. He had assisted him in the publication and editing of THE LANCET, and having lent him the benefit of his stormy experiences in the battles against the College of Surgeons, it is not surprising that he considered him to have fought those battles upon proper lines. In approving of Wakley and commending him to Finsbury as a reform candidate, Cobbett was promoting the election of a man to whom he had taught the game of constitutional agitation. Hume's connexion with Wakley was later, dating only from the presentation of the petition of the Members of the College of Surgeons to the House of Commons. Hume, it may be remembered, took the chair at the meetings of the Members which had their outcome in the petition, and, being on those occasions brought into close contact with Wakley, had been very much impressed with his powers as a speaker and as an organiser, and with the obvious enthusiasm and sincerity of his actions.

Hume and Cobbett recommended Wakley to the voters of Finsbury, but only at the last moment, and when there were already four candidates in the field—two Conservatives, the Right Honourable Robert Grant, afterwards governor of Bombay, and Mr. Serjeant Spankie, a Conservative barrister; and two Liberals, Mr. Christopher Temple, also a barrister, and Mr. Charles Babbage, the inventor of the calculating machine. The Liberal candidates were not prepared to go the lengths necessary to commend them to Hume and Cobbett, who therefore thought of Wakley. As a result of their representations and the local work of a Mr. George Rogers, Wakley was invited by an influential group of trusty voters to represent them in Parliament, the following being the letter of invitation:—

We, the undersigned, electors of the Borough of Finsbury, being anxious that our newly-attained franchise should be used as a means of promoting the interests of the great body of the people, and believing that your political opinions are in unison with our own, respectfully request you to state whether you are willing to become our representative in Parliament provided you are elected in a constitutional manner.

We on our part pledge ourselves to the endeavour to impress upon our fellow electors the propriety of protecting our representatives from electioneering expenses of every description; and we will ourselves promote that object to the utmost of our power, knowing as we do that in asking you to devote your time and unceasing attention to our interests

in Parliament we require of you as great a sacrifice as an honest man can or ought to make.

We invite a public reply to this requisition, and in that reply we invite you to declare your opinions on the great political questions which are at this moment so important to all—namely, the extension of the suffrage, the duration of Parliament, the abolition of all property qualifications either for electors or elected, the repeal of the law of primogeniture, the continuance of tithes, corn laws, trade monopolies, stamps on newspapers, and the system of slavery.

We are also anxious to learn your sentiments on the propriety of a complete revisal of the laws, civil, criminal, and parochial, with a view to simplify and condense their enactments and thereby to relieve the community from the enormous expense at present invariably incurred in every attempt to obtain justice.

We shall also be glad to learn from you how far, in your opinion, a representative ought to be governed by the opinions of a majority of his constituents, when made known to him through a public meeting convened for that purpose, and how far he is in honour bound at their request to resign his trust into their hands.

Should your opinions on the above subjects accord with our own, we pledge ourselves to nominate and support you at the ensuing election, and from our knowledge of the opinions and wishes of our fellow-electors we confidently anticipate that our exertions will lead to a successful and triumphant termination.

(To be continued.)

APPARATUS FOR THE ASEPTIC MANIPULATION OF FLUIDS.

BY HAROLD NOLAN.

(FROM THE BRITISH INSTITUTE OF PREVENTIVE MEDICINE.)

I.—FILTERING APPARATUS AND MEANS FOR BOTTLING UNDER CONDITIONS OF PRACTICAL ASEPSIS.

WHERE fluids may not be sterilised by heat, as is the case with therapeutic serum or of the new raw culture media, it is generally necessary to filter through a porous cylinder in order to render the liquid aseptic. There will be described below—(*a*) a suitable form of apparatus for effecting this filtration; and (*b*) a means whereby the fluid may be filled into tubes under conditions of practical asepsis, conditions, however, not so rigorous as those afforded by the use of the apparatus to be described in the second part of this paper.

(*a*) A Berkefeld bougie with a cylindrical mantle is connected by strong caoutchouc tubing to a glass tube. The latter passes through an indiarubber bung in the neck of a conical filtering flask ("Kitasato flask"). Through the same bung there passes a second tube, which, coming from the bottom of the flask, near the side, passes through the bung and curves over outside. Here there is attached a short length of caoutchouc tubing bearing a Mohr's burette-clip. To this tubing there is attached a glass pipette. The last inch of this pipette is protected by a glass hood 4 cm. in external diameter and about 4 cm. long. The opening of the hood is plugged with cotton wool. The side tube of the filtering flask has a short length of caoutchouc pressure tubing wired to it, to which in turn is wired a piece of glass tubing provided with two constrictions, between which cotton-wool is tightly and evenly packed. The upper end of the mantle is fitted with a tight bung perforated by a small and a large opening. The latter is merely for the exit of air and is plugged with wool and provided with a stopcock; the smaller is provided with a tube leading to a tubulure near the bottom of a carboy of two litres capacity. The mouth of this carboy is plugged with cotton-wool. The whole is now sterilised in an autoclave. When the apparatus is cool the fluid is placed in the carboy, which is raised above the level of the bougie. The air-exit tube in the mouth is opened and the fluid is allowed to flow until the bougie is covered. The air exit is now closed and the air in the filtering flask exhausted through the side tube. In this way a constant and automatically regulated flow of fluid to the filter is maintained. (*b*) When enough fluid has entered the flask the tube leading to the filter is tightly clipped and cut above the clip; thus the flask is detached. Two courses may now be pursued. Where only one operator is available, or where the asepsis must be rigorously certain, the apparatus described in the second part of this article must be attached to the syphon tube. In this case the Mohr's clip on the syphon tube has been replaced by a removable screw clamp, and the penultimate half inch of the syphon pipette surrounded by a piece of seamless caoutchouc tubing of such a size as to make a tight joint when introduced into a tube of 15 mm. internal diameter. Where, however, two or three operators are available the method now to be described will prove quite satisfactory. To the side tube which was used for exhaustion of the air a tube is attached leading to the laboratory footblower. By means of this the air in the flask is compressed, and on opening the clip of the syphon tube the fluid will fill this latter. The plug of the hooded pipette is now withdrawn and the end of the tube well flamed. The bottles or tubes, having been already plugged and sterilised, are now unplugged one by one, slightly flamed, pushed up under the hood, and filled by opening the clip on the syphon, the pressure on the fluid in the flask being maintained by means of the footblower. Each bottle when full should be handed to the second operator, who flames the mouth and inserts a sterile cork or plug. If an antiseptic is to be added a third operator will be required between the above two. By this method, with three operators, 400 tubes, each containing 10 c.c., can be filled, corked, and camphor added, in one hour. The apparatus described above has been in constant use in this Institute since July, 1895. Thousands of bottles of serum have been filled by means of it with satisfactory results. Also, many litres of raw, highly albuminous culture media have been prepared and filled into culture vessels without becoming contaminated.

II.—FILLING OR BOTTLING APPARATUS FOR STRICT ASEPSIS.

The apparatus described below has been constructed to render possible the performance of certain operations under conditions of rigorous asepsis. By its use the manipulation of putrescible fluids may be carried out in a germ free atmosphere and therefore more leisurely than with the ordinary methods. As described below, the apparatus includes its own steriliser, and it is intended for steam sterilisation at 100° C., but by obvious modifications it may be adapted for sterilisation under pressure.

The body of the instrument consists of a copper box roofed in by glazed frames. The floor is perforated in several places to admit steam from the boiler. The front and back walls are rectangular and measure 40 centimetres in length and 22 centimetres in height. The side walls are irregularly hexagonal in outline. The lowest edge is 26 centimetres long. The front and back edges correspond with the lateral edges of the front and back walls and are 22 centimetres high. From the upper extremity of each of these there slopes upwards and inwards an edge; the anterior slope is a gradient of 14 in 18, the posterior of 14 in 16. These sloping edges are united above by a horizontal edge of 5 centimetres in width, which corresponds to the end of a copper bar or roof-ridge running longitudinally along the top of the instrument. Skirting the boundaries of each of the two rectangular openings thus formed there runs a continuous groove whose mean depth is twelve millimetres. The inner edge of each groove presents a continuous flattened surface six millimetres broad, parallel to the general surface of the opening, and sunk five millimetres below that surface. There are thus formed two grooved frames, in each of which is laid a framed sheet of patent plate glass resting on a bed formed by packing the groove with cotton wool. These glazed frames may be fixed in position by bolts working in sockets borne by the roof-ridge. The roof-ridge is 50 mm. wide and is perforated by three or more tubes about two centimetres in internal diameter. One of these is plugged with cotton wool and is for the exit of steam; the remainder are fitted with indiarubber bungs perforated for syphons and pipettes. Through each bung there passes a glass tube, about 12 cm. long, which expands above into an open cylinder 18 mm. long and 15 mm. in internal diameter. During sterilisation this is plugged with wool and covered with a paper cap. When the apparatus is brought into use the plugs are removed and a Bunsen flame directed over the opening, into which the end of the syphon tube is passed, making a tight junction by means of the caoutchouc washer on it. Below this tube is united to a short pipette by caoutchouc tubing having a Mohr's clip.

The front wall is perforated by two elliptical openings; the horizontal and longest axis of each is 100 mm. and the shortest 85 mm.; the centres are 27 centimetres apart. To the circumference of each of these there is screwed, by butterfly nuts, a brass ring or washer carrying an india-rubber gauntlet, by means of which the operator can make manipulations in the interior of the instrument without introducing contaminations. The boiler is continuous with the body of the instrument and is separated from the latter by the floor, through the perforations in which passage is afforded to the steam. At the side there are provided a tap and a water-gauge. The dimensions of the boiler are 40 cm. × 26 cm. × 15 cm. At the level of the floor of the body of the instrument there projects horizontally a flange 5 centimetres wide running round the outside of the instrument. This flange is strengthened at ten points by U-shaped brass pieces placed below with the concavity outwards. The flange is cut away above the hollow of the U, and in each of the spaces so formed there is hinged a bolt carrying a butterfly nut. The use of this flange and its nuts and bolts will be indicated below.

For the protection of the glass during sterilisation and to ensure a uniform temperature throughout the instrument a hood is provided. This hood is made of copper, faced externally with asbestos; it is provided above with an outlet for steam. In general outline it is similar to the body of the instrument which it covers, and its dimensions are sufficiently large to leave space for the short tubes in the roof ridge of the apparatus. It terminates below in a flange corresponding to that described above, to which it is bolted during sterilisation, a felt washer being interposed. If the apparatus is to be employed for filling bottles trays must be provided for these and for the corks; these of course will stand on the floor of the instrument.

The instrument as above will accommodate two bottle trays 4·5 cm. × 22 cm. × 12 cm. and one cork tray 14 cm. × 22 cm. × 12 cm.; the perforations for admission of steam are so placed as not to lie directly under a tray. There is no need to plug the bottles, they remain sufficiently dry if placed inverted in the trays. The cork tray should, however, be provided with a removable lid.

These dimensions allow for from 90 to 100 tubes of 30 c.c.'s capacity or less. The accommodation may easily be increased without any increase in the bulk of the apparatus. The back wall and each of the side walls are perforated by oblong openings strengthened by thickenings of the wall. To these openings are screwed brass washers carrying india-rubber bags, each large enough to hold one tray. During sterilisation the extra trays full of bottles are piled up in the instrument, but on commencing operations are placed in the bags, which are supported by brass rods or stays. Accommodation is thus provided for at least 270 bottles.

It may be well to point out that this apparatus may be used for many purposes other than that mentioned; for instance, it may by slight modifications be rendered useful for the aseptic removal post mortem of such organs as the pancreas. The instrument is made by Messrs. Baird and Tatlock.

THE MEDICAL PROFESSION AND INCOME TAX.

(WITH SPECIAL REFERENCE TO SCHEDULE D.)

ONE of our readers in Cambridge writes asking for information as to all the deductions he can make in sending in a statement for income tax purposes. Not knowing his special circumstances it is not possible to state exactly all the deductions he can make; but, presuming that he is an ordinary practitioner with no other income than that derived from his profession, the deductions he may lawfully claim are fairly clear. Probably, whilst we are endeavouring to help our correspondent, it may not be wasting space if we go a little more fully into the operations of Schedule D than we had at first intended to. Maybe we shall not be conveying anything new to the majority of our readers, but, on the other hand, our remarks may be useful to the minority.

There is no doubt that medical men, owing in a large measure to the remissness with which they send in their returns and to their almost entire ignorance of the deductions to which they are entitled for professional expenses, are annually assessed greatly in excess of their earnings. It cannot be too emphatically laid down that the duty under Schedule D should be computed upon the balance of profits on an average of the *three* years preceding the date of assessment, thus allowing the possible losses of one or two years to be set off against the profits of another year, and where the profits are gradually increasing making the assessment upon the average of three years instead of upon the enhanced profit of the last year of the period. As an instance of the former, A. B. at the end of the year 1895 finds that he has made a net profit of £550. In 1894 he made a profit of £420, but in 1893 he had a loss of £260. It would, therefore, work out thus:—

Net profit for 1895	£550	0	0
,, ,, 1894	420	0	0
	970	0	0
Less loss for 1893	260	0	0
Total profits for three years	710	0	0
Average annual profits	236	13	4
Less abatement (being under £400) ...	160	0	0
Total on which duty is payable	£76	13	4

Thus clearly showing the advantage of the three years' average, because, if the duty were payable on the profits of the year 1895, he would have had to pay on £550, which, at 8*d.* in the £, would have amounted to £18 6*s.* 8*d.*, whereas on the three years' principle the sum to be assessed was only £76 13*s.* 4*d.*, the duty on which, calculated as £77, amounted to £2 11*s.* 4*d.*, showing a saving of £15 15*s.* 4*d.* Where a business has been commenced within the three years, the assessment will be made on the average of profits from the period of commencing it to the day on which the last annual accounts are made up, or to April 5th. If commenced within the year of assessment, then the duty payable would be on the profits to the best of the knowledge and belief of the person making the return. Where a business already established is taken over the incoming proprietor is charged the same as his predecessor.

Having now briefly described the method by which the average for assessment is arrived at, it must next be borne in mind that all incomes and profits of £160 and under are exempted from tax, and that an abatement of £160 is allowed when the income does not exceed £400, and an abatement of £100 when the income is over £400 but does not exceed £500. And here it should be carefully noted that to get the advantage of abatement it must be *claimed;* it is not sufficient for a person to return his income at, say, £350, thinking that the surveyor will himself make the abatement of £160 allowed by statute. The surveyor will assess on the amount actually returned, and when no abatement is claimed will not allow any. Why this should be so, seeing that the Act distinctly allows the reduction, is not apparent.

To come more nearly to the question asked by our correspondent, it is not, of course, possible in the short space at our disposal to enumerate at length the many items which may, and which may not, be deducted in arriving at the net profits of the year's working; but it should always be remembered that the first principle of income tax is that the sum to be assessed is the balance of profits or gains arising from any profession, trade, or other concern remaining after the *bonâ-fide* expenses incurred in acquiring such profits have been met. If this principle be thoroughly borne in mind and firmly grasped when preparing a return for income tax purposes, the person making such return will not go very far wrong.

We purpose now giving an example of an account which may very well meet the case of the majority of the readers of THE LANCET, and also serve as a guide to them in making their returns. The account is one which was actually produced to the Commissioners, and is quoted in Affleck's "Guide to the Income Tax Law and Practice."[1]

A medical man having omitted to make a return was assessed for 1894-95 at £700, against which he appealed, and produced the annexed statement (see table on next page). The statement satisfying the Commissioners, the assessment was reduced to £397, and there being no other source of income the abatement of £160 was allowed, and the amount upon which tax was payable was reduced from £700 to £237.

[1] Guide to the Income Tax Law and Practice: by J. Affleck, Jun., Manchester, 72, Market-street. Price 5*s.*

The cost of maintaining consulting-rooms, apart from the actual place of residence, for the exclusive purposes of business is a legitimate item for deduction, as will be noticed in the above statement, and all expenses incurred in the up-keep of such rooms may be deducted. When the place of residence is used also partly for business purposes a sum not exceeding two-thirds of the annual value or rent may be allowed by the Commissioners, and should be deducted when making the return. Another item which may be deducted (and which, unfortunately, is no stranger to the medical profession) is that of bad debts, as also doubtful debts, according to their estimated value. Under the heading rent, rates, &c., should be included fire-insurance premiums, all rates, gas and water rents, and rent of business premises, but not the amount paid for income tax. No allowance is permitted for this latter, or for any sums paid as salaries to partners or principals, or for the maintenance of themselves, or families, or establishments. The amount of the premium paid for life insurance or for a deferred annuity, either on the life or for the benefit of the person making the return, or on and for his wife, may be put in, provided that it is not more than one-sixth of the income from every source, and provided also that it does not so operate as to give total exemption. For instance, a person with an income of £170 who paid £15 a year for life insurance would not be permitted to claim total exemption, nor would abatement be allowed where it had the effect of reducing the income below £500. It should be borne in mind by those who have any income arising from dividends, interest, &c., that in nearly all cases the amounts have been taxed before being paid over to them, and consequently should not be returned under Schedule D if they have been so taxed. Where a partnership exists and the profits when divided are under £500 for *each* partner, the parties should claim to be separately assessed (filling up Table No. 5 on page 3 of Form 11), as by this means abatement or total exemption may be claimed. For instance, A. B. and C. D. are in partnership, and the net profits for their last financial year amounted to £750. If this sum be returned under a joint partnership account the duty payable on the full amount would be £25. If, on the other hand, they claimed to be separately assessed, and their shares in the business were equal, they would each return their incomes as £375, claim abatement of £160, and if there were no other deductions to be made, such as life insurance, &c., would each pay duty on £215, amounting to £7 3*s.* 4*d.*; or if the net profits of the partnership did not exceed £320 they could, where separately assessed, claim exemption altogether. Another advantage of the separate assessment (though one, perhaps, not particularly affecting the medical profession, seeing that its members are not engaged in trade) is that the losses sustained in one concern can be set off against the profits acquired in another. For example, the above-mentioned C. D., who returns his income from the partnership account as £375, *might* be engaged in another concern and have sustained a loss on his year's working amounting to £225. He would be entitled to set this against the £375, reducing his income to £150, which, seeing that it is under the minimum, £160, would exempt him altogether from the payment of any duty that year. Whilst on the subject of partnership, we may mention a case which recently came under our notice where the partners made the joint return and paid the duty demanded. One of them afterwards filled up the usual official form (No. 11) annually circulated by the Inland Revenue authorities stating his income as such and such a sum, and the usual demand note for payment of duty followed. The duty was accordingly paid, the person making the return overlooking the fact that the duty had already been paid on his income in the joint partnership account, and, therefore, was not again chargeable. Instead of setting forth the particulars of his income he should have filled in Table No. 4 on the form declaring that he was a partner in trade chargeable under the joint assessment of the firm.

With regard to claiming repayment of duty, most people are under the impression that income tax once paid is lost for ever. No doubt the authorities are not anxious to dispel this notion, seeing that it annually brings in many thousands of pounds to help to swell the national revenue. But repayment can be obtained, provided the claim for such repayment be made within three years next after the end of the year of assessment to which the claim relates. Thus a person lodging a claim now could recover for the years 1893–4, 1894–95, and 1895–6; and after next year's tax is paid could include 1896–7 as well, if the claim for repayment be made before April 5th. Should, however, the claim be delayed to April 6th, the amount for the year 1893–4 would be lost for ever, as April 6th is after the end of the financial year. The necessary forms for claiming repayment can be obtained from the surveyor of taxes in the district in which the person claiming resides. As the inland revenue authorities also are not behindhand in claiming payment of back duty, it may be pointed out that it is doubtful whether under Statute 43 and 44 Vict., c, 19, sec. 63, back duty can be recovered by the Crown after the expiration of the year following the year of assessment. Surveyors will, as a rule, submit that there is no bar to the claim of the Crown; and one surveyor with whom we recently conversed on the subject expressed his ignorance of the section of the statute referred

DR. *Profit and Loss Account for Three Years—1891-92, 1892-93, 1893-94.* CR.

	1891-92.			1892-93.			1893-94.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
To Drugs and Instruments ...	45	7	4	19	11	5	36	9	7
,, Medical Works, Journals, &c....	8	0	0	3	6	0	9	2	0
,, Assistants and Locum Tenens...	130	0	0	130	0	0	125	0	9
,, Rent, Rates, &c., of Chambers	40	0	0	40	0	0	40	0	0
,, Rent of House (two-thirds)	35	0	0	35	0	0	35	0	0
,, Wages and Keep of Coachman	75	0	0	75	0	0	75	0	0
,, Provender, Harness, &c....	68	9	4	70	2	8	73	8	2
,, Stationery and Sundries ...	11	1	3	9	11	1	12	3	11
,, Wear and Tear of Carriages	20	0	0	20	0	0	20	0	0
,, Profits	490	0	0	380	0	0	320	0	0
	920	17	11	782	11	0	746	3	8

	1891-92.			1892-93.			1893-94.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
By gross receipts	920	17	11	782	11	0	746	3	8
	920	17	11	782	11	0	746	3	8

Profit—1891–92	£490	0	0
,, 1892–93	380	0	0
,, 1893–94	320	0	0
	3)1190	0	0
Average	£397	0	0

to, but in a sufficiently half-hearted manner to cause us to doubt whether his ignorance was real or assumed.

In concluding our remarks on the subject generally, we desire to point out that we have scarcely touched even the fringe of the matter, as any attempt to deal with the whole question would occupy far more space than we have at our disposal, and would probably not be of any particular interest to the profession. But we trust that the remarks called forth by the question of our Cambridge correspondent will be found useful both to him and to medical men generally.

IMPORTANT IMPROVEMENTS IN THE APPLICATION OF THE "X" RAYS TO MEDICINE.

DEMONSTRATION AT "THE LANCET" OFFICES.

WE announced in our issue of June 6th that an important improvement had been effected by the General Electrical Company of Berlin in the Roentgen apparatus, and especially in the vacuum tube, so that it was possible to observe peculiarities in the interior of the head and throat, and especially the action of the lungs and heart, by direct inspection with the fluorescent screen. The results were demonstrated before several medical men representing the chief European capitals at the recent Twenty-fifth Surgical Congress at Berlin. This demonstration was repeated (for the first time, we believe, in London) at THE LANCET Offices on Tuesday last in the presence of several distinguished physicians and surgeons. Dr. Oscar Levy undertook the demonstration, which was attended with marked success. The vacuum tube he employed contained two concave electrodes, midway between which is situated a platinum disc in a plane of 45 degrees. One or other of the electrodes, according to which gives the best results, is connected up by means of a wire to this disc, the wires from the coil being attached to the concave electrodes so that the anode is duplicated. The screen employed measured about ten inches by eighteen inches, and consisted of small crystals of platinocyanide of barium dusted on to an adherent surface. Although the results obtained are probably capable of further improvement, still they were sufficiently good to indicate the probable value in the very near future of the "x" rays in diagnosing certain conditions. They were, at any rate, far in advance of anything that has yet been achieved. It was thought on the discovery of the "x" rays that a new epoch in diagnosis had been reached. Experience, however, has since shown that the application of the discovery was restricted to the exploration of the extremities in the examination of bony structure and in the search for foreign bodies. The photography of the chest and abdominal cavity by means of the "x" rays has been attended with but small success, at least to be of any value in medical diagnosis. By means, however, of this new tube, which appears to afford the maximum energy in regard to the production of "x" rays, the labour and trouble of photography may be dispensed with, and a direct vision of certain abnormalities of the heart and in the chest may, as was shown in this demonstration, be gained.

The following were amongst the results shown. When the head was placed between the tube and the screen the thickness of the scalp was easily visible, the hair not appearing. The light penetrates the cartilages of the nose, which are only visible in slight shadows. The frontal cavity and the antrum of Highmore are to be seen as distinctly lighter areas. In the neck are to be seen the shadows of the œsophagus, of the hyoid bone, and the cartilages of the larynx (the last not as distinctly as the hyoid bone), which both in rest and in movement are easily detected. If the light be thrown through the thorax from behind the screen gives the following picture: In the middle occurs a dark broad stripe, the sternum; on both sides are to be seen horizontal shadows crossing each other, which are plainly the ribs; the lower margin of the thorax is represented by a shadow, the left side of which is pale and thin, but the right side is intensely dark. The picture is still better if the rays be thrown from the front and the screen placed behind, only in this case the vertebræ are seen, and not the sternum. The shadow-line, which is constantly moved on inspiration and expiration for about three inches, is the diaphragm, and the darker shadow on the right side is the liver and the lighter on the left is the stomach. This picture shows, further, that the diaphragm and the ribs are situated at a very acute angle with one another. Another big shadow is seen immediately above the diaphragm and in the middle of the thorax. This shadow (that of the heart) consists of an intensely dark central part with a relatively light periphery. The movement of the heart is distinctly visible, principally at the apex, but on close examination the movement of the aorta may be noticed also. The heart shadow and the movement are emphasised after a deep inspiration has been taken. If now the tube and screen be moved downwards the light is thrown through the stomach. The limits of this organ may be well seen, but the definition is far better after it has been distended by the administration of an effervescing mixture.

The following cases are of interest as having been demonstrated by Dr. Max Levy (the designer of the tube) in Berlin, in collaboration with Professor Grunmach and Dr. Dubois Reymond, with substantially the same apparatus which was employed by Dr. Oscar Levy (his brother) at THE LANCET Offices on Tuesday last. In the first case, that of arteriosclerosis, a man aged fifty-six years had complained of heart trouble. An examination with the screen of the radial and ulnar artery gave results in harmony with the palpation. There were to be seen distinct thin shadows besides the thick shadows of the bones. The rise and fall of the diaphragm were distinctly seen, but instead of measuring one and a half inches on a deep inspiration being taken it measured only three-quarters of an inch. Intensely dark stripes were visible in the region of the coronary arteries indicating calcification in the horizontal as well as in the perpendicular position, but less in the latter case. Just above the heart shadow a very dark and broad moving shadow was visible, which was twice as broad as the normal shadow of the aorta. Case 2 was that of a young man aged twenty-six years who had suffered from hæmorrhage of the lungs eighteen months previously. His mother suffered from phthisis. He complained of respiratory trouble, but little could be diagnosed by ordinary methods. On viewing the thorax by means of the screen and new tube three or four dark patches in the right side came into view perfectly distinct and in striking contrast to the normal transparency of the lungs; the left lung was free from patches. The conclusion was drawn that the calcification of the previously affected parts of the right lung had supervened, which were those rendered visible by the "x" rays. Two other cases illustrated the value of the application of the "x" rays in etiology.

In two cases of mitral insufficiency, both showing on percussion enlargement of the heart, the diagnosis was confirmed by the shadows of the heart appearing considerably enlarged on the screen, but the first case, in which there was also high pulse tension, showed a great hypertrophy of the left ventricle. The second case showed no such hypertrophy, neither was the arterial tension increased. In the first case also the Roentgen picture of the thorax showed above the enlarged heart shadow another broad, dark, moving shadow, while in the second case this shadow was only half the size and much lighter. The broad big shadow was similar to that described in the case of arteriosclerosis, and is easily accounted for by the calcification of the aorta. The difference in the etiology of these two cases was made plain by the use of this screen. The hypertrophy in the first case depended upon arteriosclerosis; in the second case, in which the shadow of the aorta was normal, the morbus cordis had obviously arisen from an attack of articular rheumatism, of which the patient gave a history.

These results demonstrate pretty conclusively, we think, the possibility in the near future of the "x" rays becoming a powerful aid in diagnosis coupled with the employment of a fluorescent screen. Already it has been fruitful in not only confirming previous methods of diagnosis, but in affording means of ascertaining with some precision certain symptoms which by methods now employed would not be indicated. The movements of a complex joint, such as the carpus, were clearly seen, and will throw a new light upon surgical anatomy.

We are indebted to the Electrical Company, Limited, of 122 and 124, Charing-cross-road, for the loan of the new modification of vacuum tube—the invention of Dr. Max Levy

engineer of the same company in Berlin—which we understand may shortly be obtained in this country for 15*s.* each, and to the Electrical Standardising, Testing, and Training Institution of Faraday House, Charing-cross-road, for the loan of a powerful induction coil, giving a six inch spark in air, and the necessary apparatus for working it from the continuous main.

Public Health and Poor Law.

LOCAL GOVERNMENT DEPARTMENT.

REPORTS OF INSPECTORS OF THE MEDICAL DEPARTMENT OF THE LOCAL GOVERNMENT BOARD.

On Enteric Fever in Wycombe Marsh, by Dr. G. S. BUCHANAN.[1]—Wycombe Marsh is a village lying in the valley of the Wye in Bucks, two miles below the borough of Chipping Wycombe, commonly known as High Wycombe, and the interest of this report, which is considerable, lies in the relation of an outbreak of enteric fever in the village to the sewage disposal of High Wycombe. The village of Wycombe Marsh is embraced in an island of low-lying land, bounded on the one side by the Wye and on the other by the Back River; and some time ago High Wycombe adopted a scheme of sewerage by which their sewage was carried to a sewage farm at the head of the island, and having its outfall into the waters of the Back River. In the later months of last year enteric fever broke out amongst the 700 people living in the Marsh village, and it is clear that each individual outbreak in every house attacked was made the subject of careful inquiry, the situation of the houses invaded, together with all the essential surroundings, being indicated in a map attached to the report. Water-supply alone gave a clue to the origin of the disease, which attacked twenty-four persons; but the supply came indifferently from shallow wells, or tube wells, or from a "runnel" rising near the Back River. Now at the lower end of the Back River is a mill dam, and owing to the conformity of the valley at this point and to mill dam influences the Back River on one side the village is maintained about 6 ft. higher than the Wye River on the other. By reason of this and other considerations, which are set forth and illustrated in the plan, the soil water travelling down the valley moves laterally from the Back River towards the Wye; and since this means that this soil water moves in a direction towards the wells in Wycombe Marsh and across them to the Wye it also means that any influence contaminating either the Back River or the soil near it above the village would almost certainly carry such contamination into the village wells. Now the sewage farm only lies 500 yards above the village; a considerable portion of the sewage at once sinks away into the pervious soil, where its flow is rapid, and both it and the Back River water flow on in precisely the direction which would lead to contamination of the soil on which the village so largely lies and of the wells which are sunk in that soil. Now enteric fever "had shown considerable prevalence" in High Wycombe during 1895, and also previously, but in 1895 its occurrence had been excessive. This being so the source of the specific infection to the village wells might easily have been due to Wycombe sewage sinking into the subsoil and contaminating the subsoil water of the low-lying land on which the village lies. The story is told in a manner which indicates considerable scientific precision and accuracy, and few will read it without coming to the conclusion that, in respect of the water for Wycombe Marsh, a remedy must be found. Either High Wycombe must so dispose of its sewage as not to contaminate the soil-water used for domestic purposes in the village or the inhabitants of the village must be provided with a water-supply which shall not be exposed to risks such as are now shown to attach to it.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Strand Sanitary District.—Dr. Francis Allan reports that three of the cases of enteric fever notified during 1895 were attributed to the consumption of shellfish, but it is not clear whether they were oysters or other shellfish. In the matter of the probable spread of infection through the agency of public libraries, the Strand Board of Works have resolved that the librarian of the St. Martin Free Library be notified of cases of infectious disease occurring in the parish of St. Paul, Covent Garden. Londoners generally will be glad to hear that much good work was done in the Strand district during 1895 in reference to smoke consumption. Dr. Allan records that complaints are at times made in reference to waggons which are loaded with manure, and which stand for long periods in and around Covent Garden, and steps have been taken to mitigate the nuisance. It is also pointed out in the report that there is no power to prevent empty fruit baskets from being carried back to the country on the top of manure loads, and attention is also drawn to the risks which obtain from the practice of conveying to London food eaten raw in the same waggons which convey back manure to the country districts. In an appendix Dr. Allan reproduces his very interesting report on the insanitary area in the Strand district which was represented to the London County Council under Part I. of the Housing of the Working Classes Act, together with the table relative to the mortality of the population living in that area.

Hackney Sanitary District.—Dr. J. King Warry estimates the population of Hackney at 215,620, the density being equal to 65·3 persons per acre. The corrected death-rate from the district was 18·6 per 1000, a rate which shows an increase of 2·3 per 1000 on that for 1894. Dr. Warry considers the increase to be due in the main to the high atmospheric temperature and the scarcity of water during July and August. An outbreak of sore-throat took place in an institution in Hackney during the year under review, and it was not apparently until after bacteriology had assisted in the diagnosis that the true nature of the cases was known. The outbreak would indeed appear to have been one of mild diphtheria, in which to the naked eye the appearance of the throats was in many cases not such as is usually recognised as diphtheria. It seems that as far back as 1892 there was a series of some 16 cases of sore-throat, but whether there was any connexion between such cases and the subsequent diphtheria would not seem clear—i.e., whether it is possible that the 1892 outbreak was one of diphtheria and that now under consideration a recrudescence and extension of it. The interval between the two outbreaks appears to have been bridged over by cases diagnosed as tonsillitis, but doubtless cases of this nature are frequently found in institutions such as that under consideration. The outbreak in question is, Dr. Warry tells us, the first which has occurred in the district in which bacteriology has been made use of. On the whole, Dr. Warry is inclined to regard the outbreak as an instance of the progressive development of the property of infectiousness. Dr. Warry records in his report an interesting instance of poisoning in a family due to the consumption of a meat pie. It appears that the pie when purchased was quite fresh, but that part of it was exposed to emanations from a foul drain. The offensiveness of the River Lea as it passes through Hackney is the subject of comment by Dr. Warry. He advocates the divergence of the Leyton and Walthamstow sewage effluents from the Lea into the metropolitan sewage system. Dr. Warry devotes considerable space to the failure of the East London Water Company to supply the district with water during the summer, and he considers, after weighing up all the evidence, that the health of Hackney suffered severely in consequence.

Willesden Urban Sanitary District.—Dr. D. S. Skinner expresses regret that the West Middlesex Water Company have not seen their way to giving a constant supply of water to his district; he also considers two gallons an insufficient flush for w.c.'s. Dr. Skinner in his observations on scarlet fever and diphtheria expresses his opinion that both these diseases have been much more influenced by the Education Act than has hitherto been supposed. The estimated population of this district in 1895 was 79,260, and the amount paid for notification during the year was £84 15*s.*, while for disinfecting rooms after infectious disease the sum of £130 16*s.* 6*d.* was expended.

Mile-end Old Town Sanitary District.—Mr. Thomas Taylor states that during the last decade the population of his district has undergone a gradual metamorphosis, a large number of the old residents having been replaced by aliens of a very mixed class. Thanks to Mr. Taylor's energetic and persistent action in reference to a preserved meat factory in his district he was able to condemn large quantities of preserved

[1] Eyre and Spottiswoode, East Harding-street, E.C.; John Menzies and Co., Edinburgh and Glasgow; Hodges, Figgis and Co., Limited, Dublin. 1896. Price 9*d.*

goods, and finally the owners were sentenced to six months' hard labour. Mile-end Old Town is still some years behind the times in the matter of disinfecting apparatus, and an attempt is now being made to adapt a hot-air machine to modern requirements. It is surely time all the metropolitan sanitary authorities possessed up-to-date apparatus.

Eccles Urban Sanitary District.—We are glad to see that Dr. J. H. Crocker is waging war with success against the privy middens in this district. These structures are not water-tight and the contents soak into the surrounding soil. Enteric fever appears to have occurred year after year in certain areas, and in these areas the privy midden mode of excrement disposal prevails. Dr. Crocker considers that the emptying of these privy middens and the wafting about by the wind of the dried superficial layers is sufficient to account for this prevalence. Dr. Crocker also demonstrates to his sanitary authority the manner in which a polluted subsoil tends to the production of diarrhœa in hot seasons, and he furnishes a table showing the relation in the case of Eccles of the temperature of the earth at four feet to the prevalence of diarrhœa and enteric fever. The Sanitary Committee are now taking energetic steps to render the privy midden nuisance less obnoxious, and they have passed a resolution that the sanitary inspector shall, when issuing preliminary notices for the abatement of nuisances arising from defective privy middens, add that in the committee's opinion the water carriage system is the only satisfactory means of abating such nuisance and preventing its recurrence. Dr. Crocker, however, observes that at the rate of alteration which obtained during 1895 it will take sixty years to remedy the existing nuisances. It seems to have been the practice in Eccles to drain the privy midden into the sewers, and Dr. Crocker reports, as an illustration as to the bad effect of this, that he has seen a 9-in. sewer completely blocked up with fine ashes. We note that a former medical officer of health for Eccles endeavoured to calculate the area of privy midden refuse present in the district and to pictorially represent the dimensions of the sewage lake fermenting in their midst. We once heard of a medical inspector of the Local Government Board who, anxious to impress upon a sanitary authority the cubic capacity of the privies in their district, facetiously invited the town council—or perhaps it was only the sanitary committee—to meet him in one. Dr. Crocker records an outbreak of what appears to have been ptomaine-poisoning caused by the consumption of pork. No deaths, however, resulted.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In thirty-three of the largest English towns 6374 births and 3513 deaths were registered during the week ending June 27th. The annual rate of mortality in these towns, which had been 16·7 and 17·3 per 1000 in the two preceding weeks, declined again last week to 16·9. In London the rate was 16·2 per 1000, while it averaged 17·4 in the thirty-two provincial towns. The lowest rates in these towns were 8·6 in Norwich, 11·7 in Burnley, 12·0 in Portsmouth, and 12·5 in Blackburn; the highest rates were 20·2 in Birmingham, 20·3 in Leeds, 21·5 in Salford, 22·4 in Preston, and 23·3 in Liverpool. The 3513 deaths included 627 which were referred to the principal zymotic diseases, against 541 and 591 in the two preceding weeks; of these, 228 resulted diarrhœa, 165 from measles, 114 from whooping-cough, 59 from diphtheria, 43 from scarlet fever, 17 from "fever" (principally enteric), and 1 from small-pox. No fatal case of any of these diseases occurred in Swansea or in Halifax; in the other towns they caused the lowest death-rates in Brighton, Blackburn, and Burnley, and the highest rates in Leicester, Sheffield, Salford, and Liverpool. The greatest mortality from measles occurred in West Ham, Sunderland, Nottingham, and Hull; from scarlet fever in Huddersfield and Salford; from whooping-cough in Birmingham, Derby, and Newcastle-upon-Tyne; and from diarrhœa in Preston, Leeds, Salford, Leicester, Birkenhead, and Liverpool. The mortality from "fever" showed no marked excess in any of the large towns. The 59 deaths from diphtheria included 37 in London, 5 in Sheffield, 3 in Croydon, and 3 in Birmingham. One fatal case of small-pox was registered in London, but not one in any other of the thirty-three towns. There were 32 cases of small-pox under treatment in the Metropolitan Asylum Hospitals and in the Highgate Small-pox Hospital on Saturday last, June 27th, against 25, 27, and 41 at the end of the three preceding weeks; 6 new cases were admitted during the week, against 8, 9, and 18 in the three preceding weeks. The number of scarlet fever patients in the Metropolitan Asylum Hospitals and in the London Fever Hospital at the end of the week was 2882, against numbers increasing from 2523 to 2811 on the eight preceding Saturdays; 322 new cases were admitted during the week, against 318, 352, and 309 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had declined from 230 to 162 in the four preceding weeks, further fell to 153 last week, and were 49 below the corrected average. The causes of 50, or 1·4 per cent., of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Portsmouth, Bristol, Cardiff, Nottingham, Newcastle-upon-Tyne, and in fourteen other smaller towns; the largest proportions of uncertified deaths were registered in West Ham, Birmingham, Manchester, and Preston.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 18·5 and 18·9 per 1000 in the two preceding weeks, declined to 17·1 during the week ending June 27th, but slightly exceeded the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 12·0 in Perth and 13·3 in Leith to 18·6 in Glasgow and 19·6 in Dundee. The 500 deaths in these towns included 28 which were referred to measles, 27 to diarrhœa, 15 to whooping-cough, 4 to diphtheria, 4 to "fever," and 3 to scarlet fever. In all, 81 deaths resulted from these principal zymotic diseases, against 69 and 80 in the two preceding weeks. These 81 deaths were equal to an annual rate of 2·8 per 1000, which was slightly below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of measles, which had been 21 and 33 in the two preceding weeks, declined again to 28 last week, of which 27 occurred in Glasgow. The 27 deaths from diarrhœa showed a further increase upon the numbers recorded in recent weeks, and included 14 in Glasgow, 6 in Aberdeen, and 4 in Edinburgh. The fatal cases of whooping-cough, which had declined from 38 to 16 in the six preceding weeks, further fell to 15 last week, of which 10 occurred in Glasgow and 3 in Paisley. The 4 deaths referred to different forms of "fever" differed but slightly from the numbers returned in recent weeks, and included 3 in Glasgow. The fatal cases of diphtheria, which had been 1 and 5 in the two preceding weeks, were 4 last week. Of the 3 deaths from scarlet fever 2 occurred in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 82 and 87 in the two preceding weeks, declined again to 75 last week, and were 24 below the number in the corresponding period of last year. The causes of 22, or more than 4 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 23·7 and 22·5 per 1000 in the two preceding weeks, rose again to 25·5 during the week ending June 27th. During the thirteen weeks of the quarter ending on Saturday last the death-rate in the city averaged 23·3 per 1000, the rate during the same period being 17·8 in London and 16·7 in Edinburgh. The 171 deaths registered in Dublin during the week under notice showed an increase of 20 upon the number in the preceding week, and included 14 which were referred to the principal zymotic diseases, against 10 and 18 in the two preceding weeks; of these, 10 resulted from diarrhœa, 2 from whooping-cough, 1 from scarlet fever, and 1 from "fever." These 14 deaths were equal to an annual rate of 2·1 per 1000, the zymotic death-rate during the same period being 3·4 in London and 1·5 in Edinburgh. The fatal cases of diarrhœa, which had been 1 and 6 in the two preceding weeks, further rose to 10 last week. The deaths referred to whooping-cough, which had increased from 1 to 5 in the three preceding weeks, declined again to 2 last week. The mortality from scarlet fever and from "fever"

also showed a decline from that recorded in recent weeks. The 171 deaths in Dublin last week included 40 of infants under one year of age, and 39 of persons aged upwards of sixty years; the deaths both of infants and of elderly persons exceeded the numbers returned in the preceding week. Six inquest cases and 6 deaths from violence were registered; and 57, or one-third, of the deaths occurred in public institutions. The causes of 10, or nearly 6 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

ARMY MEDICAL STAFF.

BRIGADE-SURGEON-LIEUTENANT-COLONEL P. R. D. GARRETT has embarked for Barbados. Surgeon-Major H. A. H. Charlton has arrived in Dublin District for duty.

Surgeon-Major John G. S. Lewis has been placed on temporary half-pay on account of ill-health.

INDIA AND THE INDIAN MEDICAL SERVICES.

THE Queen has approved of the following promotions among the officers of the Indian Medical Service:—Surgeon-Majors to be Surgeon-Lieutenant-Colonels: *Bengal Establishment:* Arthur Thomes, M.D., William Arthur Mawson, Sorabshaw Hormasji Dantra, M.D., Henry Hamilton, M.D., Bernard Doyle, Robert Cobb, Augustus Edward Richard Stephens, and William Hotson Cadge. *Madras Establishment:* John Maitland, M.D., George Lemon Walker, M.D., Charles Lethbridge Swaine, M.D., and Maurice Henry Smith. *Bombay Establishment:* John Macgregor, M.D., Alexander Kenneth Stewart, William George Hume Henderson, Kharshedji Ardeshir Dalal, and Henry Walker Butler Boyd. Surgeon-Captains to be Surgeon-Majors: *Bengal Establishment:* John Henry Tull Walsh, Harold Hendley, George Herbert Fink, Hormasjie Edaljie Banatvala, and William George Patrick Alpin, M.D. The Queen has approved of the retirement from the service of Brigade-Surgeon-Lieutenant-Colonel Francis Cobham Nicholson, and has approved of the resignation of Surgeon-Lieutenant Alfred Edward Joseph Ward. The services of Surgeon-Captain F. P. Maynard are replaced at the disposal of the Government of Bengal, and the services of Surgeon-Captain J. C. S. Vaughan are placed permanently at the disposal of the same Government.

NAVAL MEDICAL SERVICE.

Surgeon George Dacre Trevor-Roper has been placed on the Retired List of his rank.

The following appointments are announced:—Staff-Surgeon H. X. Browne to the *Camperdown;* Surgeon C. L. Nolan to the *Melampus.*

THE SOUDAN CAMPAIGN.

According to all reports and to the statements of refugees the native population of the Soudan are thoroughly tired of the tyrannical rule of the Khalifa and of the devastation which has been brought about by it. There is at present a pause in the operations of the Anglo-Egyptian expedition, but the interval has been employed in accumulating stores of all kinds for the future advance on Dongola, in pushing on the railway, and in completing the transport arrangements. The Nile is slowly rising and the state of the river will soon be such as to materially add to the means of transport. There is an increasing scarcity of food, the price of provisions throughout the Soudan is very high, and trade is closed. These circumstances are believed to be a source of grave difficulty and embarrassment to the Dervish forces at Dongola and elsewhere. Notwithstanding that the general health and spirits of the troops composing the Anglo-Egyptian expedition are excellent, the appearance of cholera at Assouan in the 1st and 5th battalions, which are detained in quarantine between Assouan and Wady Halfa, is an unfortunate cause of some anxiety, apart from the delays and difficulties entailed by the adoption of necessary precautionary measures against the spread of the disease. The affected battalions were on their way from Suakin to the front when attacked.

THE RISING IN MASHONALAND.

The news that reaches this country from South Africa has been of a somewhat gloomy character and far from satisfactory of late. It is reassuring under these circumstances to learn that no further troops are, in the opinion of General Goodenough and Sir F. Carrington, required for the present to deal with the native rising, notwithstanding that the insurrection has greatly extended its dimensions and has already given rise to much bloodshed and a serious loss of life. The Government of this country have evidently been contemplating the probability of their being called upon to send reinforcements to South Africa and have intimated to the authorities there that they are quite ready to despatch an additional force when required. For political reasons it has been deemed expedient to select British and not Indian troops for the purpose. The Secretary of State for War has already sent instructions to Malta to dispatch the 2nd Battalion King's Royal Rifles to the Cape as soon as the necessary arrangements can be made for the embarkation of the regiment, which is over 1000 strong.

ROYAL MILITARY TOURNAMENT.

"The takings at the Royal Military Tournament this year," says the *Army and Navy Gazette* "amounted to over £20,000, and it is hoped to hand as the net result some £3500 to the Commander-in-Chief for distribution as he may decide among the military charities. Lord Methuen and his committee are to be congratulated. The task they assumed was one fraught with difficulty, and it is highly creditable to all concerned that the result is so eminently satisfactory. It has to be remembered that this was the committee's first attempt to run the display on purely military lines, and it is no exaggeration to say that they earned the confidence of all associated with them in the management of affairs. ..... In its changed, and, in many respects, improved aspect, the Royal Military Tournament has been able to attract crowded houses to Islington at each performance. ..... May Lord Methuen and his colleagues go on and prosper, for they have unquestionably rendered a great service to the Army and its charities."

THE WEIGHT THAT CAN BE CARRIED BY SOLDIERS.

According to the *Army and Navy Gazette* the German military authorities have been experimenting in this direction and have come to the conclusion that 60 lb. is about the maximum weight that a soldier can carry on a march, of twenty-five miles per diem in a temperate climate where the temperature does not exceed 60° F., if the march is to be continued for a number of days. A load of 68 lb. could not be carried twenty-five miles without danger of serious injury, and one of 60 lb. had a temporarily bad effect when carried in a temperature of 70° F. and upwards.

Correspondence.

"Audi alteram partem."

THE DEFACEMENT OF PRESCRIPTIONS.

To the Editors of THE LANCET.

SIRS,—It is time for a protest to be made against the custom of the defacement of prescriptions by the druggists who dispense them. It is not uncommon to see a prescription on which the whole space written upon is occupied by the impressions of rubber stamps. A prescription is not the property of the druggist to put on it his name and address. If there is any justification for such stamping the back of the prescription is free to receive these many coloured marks. Every legitimate purpose such as the record of a number can be served by the back as well as by the front. But dispensers go still farther. I have seen several prescriptions in which alterations in the dose of certain constituents had been made. Against every one of the constituents there had been written in ink by the druggist the initials of the firm and the date in figures. In one of these there was repeated five times "A. & H., 16/4/96" (the date is at random). This can be only for the druggist's private convenience, and is quite without even the semblance of warrant. I maintain that no impression of a stamp or writing should be placed on the face of a prescription by the dispensers. I believe my contention will be widely supported by the profession and ought to be the subject of a definite rule by the Pharmaceutical Society, which should soon terminate the objectionable practice.

I am, Sirs, yours faithfully,

June 27th, 1896. W. R. GOWERS.

"DIRECT REPRESENTATION ON THE GENERAL MEDICAL COUNCIL."

To the Editors of THE LANCET.

SIRS,—I am obliged for your insertion of my letter in your issue of June 27th and I hope you will find further space for the following resolution, which, on the motion of Dr. Woodcock and seconded by Mr. Holden of Preston, was unanimously adopted at the annual meeting of the Lancashire and Cheshire Branch held in Southport and also previously at the Council meeting: "That the members of this branch desire to express their great regret at the resignation of Mr. Wheelhouse and Sir Walter Foster, and to tender them their most grateful thanks for the long and valuable services which they have rendered to the profession in the General Medical Council." I am, Sirs, yours truly,

JAMES BARR,
Hon. Secretary, Lancashire and Cheshire Branch, British Medical Association.

Rodney-street, Liverpool, June 29th, 1896.

To the Editors of THE LANCET.

SIRS,—In reply to the questions submitted to me by the Incorporated Medical Practitioners' Association, my views are:—

"1. That we require reform of the Medical Acts, and I would support any motion to that effect. 2. I would oppose any proposal to register midwives as independent practitioners. 3. I would support any motion condemning the holding of appointments under medical aid associations which make a profit out of their medical officer and who canvass from door to door. 4. I am in favour of increased representation on the Medical Council."

I have been asked by several of those who supported me at the first election to stand again and I have consented to do so. I am, Sirs, yours faithfully,

THOMAS M. DOLAN, M.D. Durh.

Halifax, June 27th, 1896.

To the Editors of THE LANCET.

SIRS,—The Central Council of the Incorporated Medical Practitioners' Association, having decided to take a preliminary poll as to the probable chance of election of the various candidates, will feel obliged if all the gentlemen who intend to present themselves at the forthcoming election of direct representatives on the General Medical Council will send in their names to the secretary at this address on or before July 11th.—I am, Sirs, yours faithfully,

FRANK GREAVES,
Hon. Sec., Incorporated Medical Practitioners' Association.

11, Adam-street, Strand, W.C., June 29th, 1896.

To the Editors of THE LANCET.

SIRS,—At the dinner subsequent to the meeting of the Lancashire and Cheshire Branch of the British Medical Association, held at Southport on June 24th, some gentlemen who were not present at the last stage of the meeting, when Mr. Horsley carried a resolution not on the agenda, agreed to and signed the following requisition, which has been duly forwarded. I am, Sirs, yours faithfully,

COLIN CAMPBELL.

"To Sir Walter Foster and Mr. C. G. Wheelhouse.

"DEAR SIRS,—We the undersigned beg to tender you our sincere thanks for the faithful services you have rendered us for the past ten years as our representative in the General Medical Council, and hereby beg you to reconsider your decision as to withdrawing from your present position and allow us to nominate you for another term of office:—

"William Stewart, Southport.
J. M. Chisholm, Liverpool.
J. W. O'Hagan, Garston.
B. Marshall, Atherton.
Charles Torbitt, Pendleton.
William Fraser, Salford.
G. H. Broadbent, Manchester.
W. H. Wolstenholme, Salford.
Colin Campbell, Saddleworth.
Lawson Tait, Birmingham.
Geo. C. Kingsbury, Blackpool.
James Robinson, Bolton.
Horace Jefferies, Bolton.
Thos. Evans Flitcroft, Bolton.
Charles Macfie, Bolton.
Arthur Jones, Southport.
E. H. Beaman, Southport.
D. A. O'Sullivan, Southport.
G. B. Barron, Southport.
Nathan Hannah, Ashton-in-Makerfield.
Charles Pinkerton, Southport.
Robert Harris, Southport.
G. Walker Steeves, Southport.
W. J. Robertson Dunn, Liverpool.
Arthur Wood, Southport.
Geo. S. Wild, Bootle.
J. Lambert, Birkenhead.
H. Hamilton, Liverpool.
Henry Halton, Leigh.
C. A. Hill, Liverpool.
John W. Watkins, Newton-le-Willows.
T. E. Hayward, Newton-le-Willows.
Charles Street, Newton-le-Willows.
Walter Whitehead, Manchester.
D. J. Leech, Manchester."

THE COUNCIL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editors of THE LANCET.

SIRS,—We have often had to complain of the reticence of members of the Council of this College, and hardly expected to have to accuse one of them of an opposite tendency. One may, however, question the propriety displayed by Mr. Hardie, who on the eve of an important decision to be arrived at by a body of which he is a member rushes into print in order to justify his vote. What would be thought if his colleagues who held different views were to follow his example? We should then have the edifying spectacle of men who have to form a judicial conclusion bandying arguments beforehand in the public press! For the Council is a judicial body and it and not the Fellows will have ultimately to decide the questions under discussion. If Mr. Hardie's object is, as he states, to influence the Fellows in favour of his own views I venture to think that he has made a tactical mistake. The replies to his arguments are really so well known that I feel ashamed again to trouble your readers with them. I will, therefore, only ask Mr. Hardie three questions. 1. Are the Members an integral part of the College or not; are they in the eyes of the law the joint owners of the corporate property, and if so should they not have some control over the policy and expenditure of the College? 2. Does the Council as at present constituted in any way represent the Members; does it endeavour to ascertain their wishes and views on current questions and so far as possible carry them out; and does it protect their interests and support them against outsiders if appealed to? 3. Did Mr. Hardie, when he became a Fellow, do so because he might thus obtain a vote for the Council; and if this were the only privilege or advantage of the Fellowship would he have taken it? Mr. Hardie flounders about sadly when he endeavours to define the position of the Council. In one sentence he says that it is "an academic body with objects and functions apart from those of the profession generally"! In the next he says that it has to uphold the interests of those who hold its diploma, and a little further down he refers the Members to "voluntary associations."

I am, Sirs, yours faithfully,

W. G. DICKINSON.

"TOXICOLOGICAL EFFECTS OF CREOLIN."

To the Editors of THE LANCET.

SIRS,—I observe in THE LANCET of June 27th a letter signed by the secretary of the Jeyes' Sanitary Compounds Company, in which reference is made to my recently published article on the "Toxicological Effects of Creolin." It is there said that my experiments were "carried on with creolin in practically undiluted form, and of course no one can expect good results." In reply permit me to say that my object was simply to ascertain whether the agents experimented with were poisons in the ordinary sense of the word. In face of the results obtained it appears to me simply absurd to deny that Jeyes' fluid or creolin is poisonous, and the fact that they may be diluted to a point of safety in no way entitles them to be described as "innocuous" or "non-poisonous." Hydrocyanic acid, in the proportion of 1 in 1000 of water, is a perfectly safe dressing for the dog's skin, but this would not justify a druggist in selling pure hydrocyanic acid as non-poisonous, even if accompanied with directions regarding dilution.

I am, Sirs, yours obediently,

FREDK. HOBDAY.

Royal Veterinary College, N.W., June 29th, 1896.

"TRANSFUSION OF SALINE FLUID INTO THE AXILLARY CELLULAR TISSUE IN CASES OF SEVERE HÆMORRHAGE."

To the Editors of THE LANCET.

SIRS,—The thanks of our profession are due to Mr. Arthur H. Dodd for the admirable communication from his pen which was published in your last issue, describing a brilliantly successful case of transfusion of saline fluid into the axillary cellular tissue in the treatment of severe

hæmorrhage due to placenta prævia. Such a record of course suggests that the method of treatment he describes may be remedial in many almost desperate cases outside obstetric practice. May I ask to be kindly furnished with a little more information as to the composition of the fluid employed for injection? I read, "the ordinary saline solution is used—i.e., a teaspoonful of common salt to the pint of boiled water." Teaspoons vary much in size. Is the teaspoonful to be heaped or level? Or, which would be better, what weight of chloride of sodium should be dissolved in twenty fluid ounces of water? I regret to give the trouble of this inquiry. The materials for searching the literature of the subject are not just now at my hand.

I am, Sirs, yours faithfully,

Birmingham, June 27th, 1896. JAMES SAWYER.

RESEARCH IN COLOUR BLINDNESS.

To the Editors of THE LANCET.

SIRS,—It is proposed to form a society for the purpose of making researches in colour blindness, instituting proper tests and preventing colour-blind and defective-sighted men from acting in capacities in the marine and railway services for which they are physically unfitted. I shall be glad to hear from those who are interested in the subject and are willing to join the society. The subscription will be 5*s.* per annum. I am, Sirs, yours faithfully,

F. W. EDRIDGE-GREEN.

Ravensfield Villas, Hendon, June 29th, 1896.

THOMAS KEITH AND THE CAUTERY.

To the Editors of THE LANCET.

SIRS,—There is only one intelligible statement in Dr. Skene Keith's letter, to the effect that his father made some experiments on animals to prove something or other about the cautery. This is the first we have heard of the circumstances. Keith took the cautery from Baker Brown first, as the latter had used it for years before Keith operated. Keith used it in the same way for over thirty years without ever suggesting modification or improvement. It therefore follows that whatever Keith may have proved by experiments on animals had been already completely proved by Baker Brown on the human body. Keith's experiments on animals were, therefore, absolutely useless and unnecessary. If the facts are as Dr. Skene Keith states it would have been better for his father's memory if he had said nothing about them, as nobody ever suspected Thomas Keith of such egregious folly. I am, Sirs, yours faithfully,

The Crescent, Birmingham, June 22nd, 1896. LAWSON TAIT.

THE BRITISH GYNÆCOLOGICAL SOCIETY.

To the Editors of THE LANCET.

SIRS,—In your notice of the remarks I made at the British Gynæcological Society on June 27th I am reported to have stated that "as a rule no one knew less of the gynæcological conditions in the insane than the medical attendants in asylums." Allow me to state I never made so impolite and false a statement in regard to these gentlemen. What I did say was, that more than once I had been instrumental in preventing the admission or in assisting in the removal of cases condemned to a lunatic asylum. I might have added under the actual direction of one of our most distinguished medical Commissioners of Lunacy. This rather proved how well versed this gentleman was in gynæcology.

I am, Sirs, yours faithfully,

C. H. F. ROUTH, M.D.LOND.

Montague-square, W., June 29th, 1896.

"THE ROYAL MILITARY TOURNAMENT."

To the Editors of THE LANCET.

SIRS,—Referring to your notice in THE LANCET of June 20th of the Royal Military Tournament I state that peat moss for the stables and baths for the competitors are not novelties but were introduced by the late committee six or seven years ago. The statement that there have been fewer accidents this year than usual, if justified by evidence, will be very gratifying to all concerned, but the facts given do not bear this out.—I am, Sirs, your obedient servant,

London, June 25th, 1896. VERAX.

*** If "Verax" will read our article he will find that we do not anywhere state that peat moss litter was used for the first time this year. With regard to the number of grave accidents at the tournament they were distinctly few, although there were a great many minor casualties. The hot-water baths in use this year were an innovation.—ED. L.

"THE REMUNERATION OF MEDICAL MEN."

To the Editors of THE LANCET.

SIRS,—May I be allowed to add briefly to the comments of your correspondent[1] on the remuneration of medical men? Whilst agreeing with nearly all of his arguments, I wish to point out that we as a profession can do much to help ourselves, especially by inculcating proper ideas of professional dignity and of self-respect into the minds of those who come to our schools for their education. Their minds are young and receptive, and obviously prone to seize upon ideas which obviously accord with their own feelings and interests. I need, therefore, say nothing more about the recruits. But these young men, who are such terrible critics—a fact to which many of their seniors seem singularly blind—must, when they are initiated, deem many of the doings around them very anomalous. What must they think when they hear that the remuneration of the demonstrators who teach them is either nothing at all or about the same as that of a labourer or perhaps of an artisan. Doubtless, they ponder and turn over in their minds all sorts of doubts and queries. They will ask, Who fixes this scale of payment? Medical men. But medical men would not be ungenerous to each other. Besides, when a medical man fixes the remuneration of his brother medical man he is, although he may not know it, fixing his own. Or, perhaps, he thinks his teacher is working for a golden future, but then he recalls X, Y, and Z, and all the other letters of the alphabet too, to whom no golden future ever came and who left their *alma mater* disappointed men with bitterness in their hearts and nothing in their pockets. It seems natural then for our tyro to ask, Why were they not properly paid? and at last he comes to the conclusion either that medical men are heartless and ungenerous to each other or that medical men ought to work for nothing. We have all seen ideas acquired in youth persistent to a green old age. But, Sirs, it would be disingenuous of me were I not to say that I already see signs of improvement in this respect. In many of our schools the juniors are being better paid by the seniors, and this is not due to a sudden accession of generosity, but to the circumstance that a profound change has overtaken medical education. The aspirants for medical and surgical posts do not care to hold unfair demonstratorships in scientific biology, physiology, chemistry, and so forth, so others have to be employed at salaries which, if still inadequate, are not absolutely ludicrous. Even human anatomy, as your advertisement columns show, is tending in the same direction. A return of the emoluments of London lecturers would be rather depressing reading, and it would be seen that academic distinction and brilliant lecturing do not command the rewards of a lucrative practice. Sirs, I do think we ought to remove from our students the object lesson of medical men being ill paid by medical men, and I do not believe it is an impracticable or impossible task. The next thing which leads a student to think that medical men ought to work for nothing is to learn that the staffs of our great hospitals are, with few exceptions, quite unpaid for their hard and exhausting labours, and when they see, in addition, unthinking or unscrupulous men lavishing their time and gratuitous services upon well-to-do and poor alike is it not natural to suppose that they think it is right and self-respecting for them to go and do likewise? Finally, Sirs, I think it is childish to say the ill remuneration and poverty of medical men are the fault of the public. In my experience the public are willing to pay, as far as their means allow, for honest and painstaking labour. But they are misled by the improvidence and portentous way in which many medical men live; by the habit which medical

[1] THE LANCET, June 20th, 1896.

men have of calling their gross income their net income; by their belief that medical men receive enormous salaries from their hospitals and appointments; by the idea which certain men, especially surgeons, try to convey that they are continually doing major operations for major fees; by the fuss which is made when a medical man by a fortunate marriage, lucky speculation, or judicious investment, leaves a fortune; and finally, by that curious, reluctant modesty which occasionally leads a medical man to deprecate the presentation of a fee. The public know perfectly well that in law, medicine, or commerce talent and experience have a full and definite value. They naturally think that he whose services are valued at nothing is worth nothing.

I am, Sirs, yours faithfully,

June 27th, 1896. M.B., F.R.C.P.

To the Editors of THE LANCET.

SIRS,—There is no town in England that does not contain medical men who will heartily accord with your correspondent "M.D." in THE LANCET of June 20th when he says: "Surely it is a monstrous injustice to medical men that when they have conformed with the law of the land by obtaining degrees and qualifications, at the expense of much labour and pecuniary sacrifice, they should have to compete with charlatans of all kinds," but such is an absolute fact; every city is infested with quacks whose ignorance is only equalled by their effrontery. Surely, Sirs, since the medical profession is now so overcrowded with duly qualified men and the competition is so great that they find it difficult, if not impossible, to earn a livelihood it ought to be an easy matter if we would only combine to effect legislation to prevent these rogues and impostors from preying upon a credulous public to their own destruction and our detriment. There is another point to which the attention of medical men ought to be directed in order that legislation may at no distant date be brought to bear upon it also. I refer to that obnoxious and most unfair system—which is also as illegal as it is universal and which does an immensity of harm to medical practitioners—the prescribing of druggists for patients over the counter. Whilst we respect druggists and their occupation within its due limits I feel certain that as a body medical men will agree with me when I say that druggists have no right to prescribe; they are as unqualified to do so as the veriest charlatan, and they do untold harm to the medical profession by their attempt to practise medicine. I venture to say that the General Medical Council could easily bring about legislation on this grievance also and thus benefit immensely the public and the profession.

I am, Sirs, yours faithfully,

June 29th, 1896. H. C. L.

To the Editors of THE LANCET.

SIRS,—In your issue of June 27th a correspondent, over the signature "M.R.C.S., L.R.C.P.," gives expression to an opinion which I think should not be allowed to pass without a word of protest. He quotes, in order, as I read his communication, to condemn, the following from the opening address of a physician to one of the London hospitals: "If the practitioner is in any doubt about the diagnosis or is unable to diagnose a case he should never prescribe." This, "told to an assembly of students, of whom some 95 per cent. or more would become general practitioners," your correspondent, I take it, holds to be false teaching. The profession is overcrowded, fees are low, and competition is of the keenest; therefore, argues "M.R.C.S., L.R.C.P.," each of its members should strive to annex what fees are going in his neighbourhood, even at the cost of prescribing for a patient without necessarily having first ascertained what is the matter with him. And "M.R.C.S., L.R.C.P." would have this manner of safeguarding the public health included in the curriculum of our medical schools and taught by our professors as a branch of the art of healing, since "the general practitioner has his living to make!" I can find no other reading than this to put upon your correspondent's suggestion, and I can think of no way of expressing my own opinion, even mildly, of his sentiments on the matter that you would be likely to print. I may mention that I speak neither as a fledgeling nor as a theorist in medicine but as a seasoned, hard-worked, and underpaid general practitioner; and it is inconceivable to me that any practitioner whose first care is the well-being of his patients should meet the suggestion of prescribing where no diagnosis has been made with anything but flat denunciation. Of course we all meet cases of which our diagnosis reads, in our private notes, "nothing the matter"—that is to say, after thorough investigation we find no organic disease but merely some trifling functional discomfort. The prescription in such case may be a *placebo*, but the diagnosis is as much the result of experience and care as any other, and if the patient's small trouble brings him to us we are justified in prescribing and charging. We all meet cases, again, which baffle us completely, but then we can surely ask a friend to supplement our efforts till either we clear up the case or pass it on to some higher authority. I should like to record my earnest conviction that no fitter words could fall upon the ears of a young man starting in practice than those which "M.R.C.S., L.R.C.P." singles out for condemnation. As for the rest of his proposals—for limiting the number of qualified practitioners, &c.—I find myself in the main in hearty disagreement with them, or with my interpretation of them rather, for his manner of formulating his ideas leaves me here and there a trifle in doubt as to his meaning. When he says, for instance, "I think parents and their sons who wish to enter our medical schools should" &c., does he contend that fathers and mothers, as well as their boys, often show themselves desirous at their advanced age of adding a medical training to their domestic and other responsibilities?

I am, Sirs, yours truly,

June 29th, 1896. ANOTHER M.R.C.S., L.R.C.P.

"CHOLERA IN EGYPT."

To the Editors of THE LANCET.

SIRS,—Your article of June 13th, "Cholera in Egypt," is hardly an accurate description of the present outbreak, the history of which briefly is as follows. Cholera introduced by pilgrims was first officially notified in October, 1895. Spreading rapidly over the region bounded by Mansourah, Damietta, and Matarieh, it was only by the most strenuous efforts of the sanitary officials that it was eventually completely stamped out in the infected region, so that by Jan. 31st, 1896, not a case remained in this region. Up to Jan. 31st 1161 cases had been officially noted and 966 deaths. Unfortunately in Alexandria alone, where the first case occurred on Dec. 28th, the disease could not be stamped out, though there was a period of ten days when no fresh case was detected. Early in May the number of cases in Alexandria largely increased, the disease assumed an epidemic form, and by the middle of May the infection was spread to Cairo and other parts of the country, throughout which there is now a more or less general infection. It is satisfactory to note that the measures adopted for the control of the disease have so far been successful in keeping it within measurable limits.

I am, Sirs, yours faithfully,

Cairo, June 18th, 1896. JUSTITIA.

THE SPECIFIC GRAVITY OF THE URINE.

To the Editors of THE LANCET.

SIRS,—A man came to my surgery in a state of extreme excitement. During the interview he asked permission to pass water. After he had gone I examined the specimen and found no albumin or sugar, but the specific gravity was only 997, less than that of pure water. Was this to be accounted for by anything but the rapid excretion of alcohol, and would the point be of any medico-legal value?

I am, Sirs, yours truly,

June 28th, 1896. M.D.

BRIGHTON WATER-SUPPLY.—The Brighton Corporation has arranged to purchase the Shoreham Waterworks, a successful private undertaking, situated on the downs far above Shoreham, having powers over the district from Lancing to Aldrington, a coast-line of about seven miles. The purchase money will be £56,700, and about £190,000 will be spent on sinking new adits and laying new mains. The passage of the Bill through Parliament was energetically opposed by various local authorities especially by Hove, which pays the Brighton Corporation for water at the rate of 9*d.* in the £1 rateable value.

THE BATTLE OF THE CLUBS.—XXXV.[1]

(FROM OUR SPECIAL COMMISSIONER.)

(*Continued from p. 1825.*)

BRUSSELS: A TWELVE MONTHS' STRIKE.—THE MEDICAL MEN FULLY COMPENSATED OUT OF THE STRIKE FUND.—THE LABOUR PARTY AND THE MEDICAL MEN.—INCREASED STRENGTH OF THE MEDICAL UNION.—THE DIFFICULTIES AND TROUBLES OF THE BENEFIT SOCIETIES.

IT was on July 6th last year that the medical strike began in Brussels and the strike is still continuing. The federation of mutualist or benefit clubs of Brussels is an institution that has been the growth of years, and it cannot be revolutionised in a day. It actually consists of ninety-four different societies federated together. The total membership is about 12,000, who with their families represent a population of about 50,000 persons. The cause and early developments of the strike were fully described in THE LANCET of Aug. 24th and 31st, 1895. It was then related that the Brussels Medical Union, or, to use the continental term, the Medical Syndicate, consisted of 430 members out of 450 to 500 medical men living in Brussels. The Syndicate now counts 453 members. During the year of arduous struggle there has been no backsliding. Not only has the union formed in Brussels increased in strength, but it has now the support of numerous new medical unions formed in the provinces and in the suburban or outlying independent boroughs that surround the town of Brussels. The experience acquired at Brussels shows us that in a struggle with a large and powerful organisation such as the Federation of Mutualists there are but two issues possible. The one may be achieved promptly, the other must be the work of months, perhaps of years. In the first instance reconciliation is effected by the acceptance of terms suitable to both parties. The other issue implies the slow, gradual disintegration of what exists to form something different and better. In this latter case the task may take, as already stated, years to accomplish. A medical union before it embarks on such an enterprise must carefully weigh both these issues and see that it is strong enough to face the one and the other. For this the first of all requisites is a strong financial basis. The Brussels Syndicate, as already explained, was founded on the understanding that each member should pay three francs for postal or current expenses and should render himself liable to meet special levies that were not to exceed, however, £4 in any one year. But as many medical men were willing to pay more than this £4, shares have been issued, the rule being that every member of the Syndicate must take at least one share. When I wrote on the subject last August I stated that so far no levy had been made. The three franc subscription had covered all expenses in spite of the strike. But as the year wore on it became necessary to make a strike allowance to the twenty medical men who had thrown up their posts as medical officers of the Mutualist Federation. For this purpose a sum of £480 was required and it was decided to make a £1 levy per share. Several medical men at once took three and some five shares. In a few days the requisite sum was in hand. Out of the 453 medical men enrolled in the ranks of the Syndicate only five failed to at once pay the £1 levy, and doubtless by this time they, too, have fulfilled this obligation.

This occurred last December, and in January the medical men on strike received from their union full compensation for the loss they had incurred by resigning their position. During the month of July a fresh levy will have to be made and a further strike allowance paid, but the sum required will not now be so large. Three out of the twenty medical men have so improved their position that they require no further strike allowance. The medical men on strike received from their union exactly the same sum as they would have received had they continued to serve the benefit societies, and the cost of management for collecting and distributing this sum did not exceed £3 8*s*. These figures, more eloquently than any words, describe the perfect discipline and organisation of the Brussels Medical Syndicate. Speaking of this remarkable result the secretary of the Syndicate, Dr. Cuylits, said at a general meeting of the Brussels medical men:—

"It is impossible for me to read the whole of the correspondence relative to this question. It clearly shows that we should render public homage to the medical corps for the part it has played in the struggle we have undertaken in the interest of all. The profession deserves our gratitude for the enthusiasm it has displayed in bringing forward a principle, in defending an idea. We should more particularly address our thanks to those who have subscribed but small sums, to those who are the least favoured by fortune and who have nevertheless imposed upon themselves the sacrifice necessary to the triumph of our cause. If we should applaud those who have given largely, how much more should we admire our young colleagues who have barely acquired a practice, who are daily struggling with every form of adversity in a new and difficult career, and yet who have stood stolidly in our ranks like the strongest and oldest among us. Such is the devotion which the Brussels medical profession has shown. May the few who hold aloof meditate on this notable example."

Speaking on the same subject Dr. Vandam, vice-president of the Brussels Medical Syndicate, said: "The devotion of all has rendered our work easy and assured success where isolated action would have meant failure. The incessant and well-sustained development of a vast association is the witness of the confidence that exists and of the power that is now recognised and accepted. The work has grown under the fertilising influence of those sentiments of loyal confraternity which have awakened that precious solidarity that alone can ensure the accomplishment of a great task. ..... In our difficulties we have been able to prove that solidarity was no vain word, and we are indeed happy and proud to render well-deserved homage to the twenty devoted colleagues who did not hesitate to sacrifice themselves so as to carry out the will of our union, who readily gave up the positions they had acquired so as to vindicate our principles and establish our rights. They understood, these excellent colleagues, that far and above a petty question of money the general interest of the entire medical profession was at stake. May they now receive the expression of the admiration and gratitude of the whole profession. All the authorised organs of the great medical family have attested their approval with unanimous enthusiasm."

These are brave words; but they have been fully justified by the facts of the case, and I reproduce them so that the members of the profession in England may associate themselves with the sentiments expressed.

The strike has now lasted a year. So far as the medical profession is concerned the effect of the strike has been to greatly increase the strength of the medical union and the unanimity of its members. It has had the further effect

[1] The previous articles on this subject were published in THE LANCET on the following dates: (1) Aug. 24th, 1895, Brussels; (2) Aug. 31st, 1895, Brussels; (3) Sept. 21st, 1895, Portsmouth; (4) Sept. 28th, 1895, Portsmouth; (5) Oct. 5th, 1895, Eastbourne; (6) Oct. 12th, 1895, Lincoln; (7) Oct. 26th, 1895, Lincoln; (8) Nov. 2nd, 1895, Grimsby; (9) Nov. 9th, 1895, Bexhill-on-Sea; (10) Nov. 16th, 1895, Hull; (11) Nov. 23rd, 1895, Hull; (12) Dec. 7th, 1895, York; (13) Dec. 14th, 1895, Northampton; (14) Dec. 21st, 1895, Fermanagh Medico-Ethical Association; (15) Dec. 28th, 1895, Northampton; (16) Jan. 4th, 1896, Birmingham; (17) Jan. 18th, 1896, Birmingham; (18) Jan. 25th, 1896, Club Practices in Rural and Mining Districts; (19) Feb. 1st, 1896, The Formation of a Provident Medical Association at Folkestone; (20) Feb. 8th, 1896, The Manchester Medical Guild and Medical Aid Associations; (21) Feb. 15th, 1896, The Leicester and Leicestershire Provident Dispensary; (22) Feb. 22nd, 1896, The Organisation of the Profession at Leicester; (23) March 7th, 1896, Loughborough: Local Efforts defeated by Consultants from Neighbouring Towns; (24) March 14th, 1896, Medical Aid Societies in Small Heath; Medical Clubs at Stockport; (25) March 21st, 1896, General Meeting of the Profession and the Formation of a Union at Nottingham; (26) April 4th, 1896, Nottingham; the London and Manchester Industrial Assurance Company, Limited; the Public-house Medical Aid Clubs; United Action at Lincoln; (27) April 11th, 1896, Leicester and Wolverhampton; a Hastings Dispensary wound up; (28) April 25th, 1896, Walsall, Formation of a Medical Union; the Medical Profession and the Friendly Societies; Trade and Medicine; the Family Clubs; Women's Public-house Clubs; (29) May 9th, 1896, Sheffield: An Ancient Medical Society; Workmen Sweaters; The Old Grievances; Probable Formation of a Medical Union; (30) May 16th, 1896, Lincoln: Medical Protection Fund started; Benefit Societies and Medical Men; Medical Union at Nottingham; (31) May 30th, 1896, Derby: The Abortive Movement of 1872; the Apathy of the Profession; Female Canvassers; the Gainsborough Dispensary; Lincoln Medical Protection Fund; "A Doctors' Strike"; (32) June 13th, 1896, The Bitter Cry of the Medical Aid Associations; letter from a Member of the Manchester Executive; Lincoln: the Provident Medical Association; Lincoln Medical Protection Fund; Fifeshire Medical Association and Medical Aid Appointments; (33) June 20th, 1896, the General Medical Council and the Medical Aid Associations; (34) June 27th, 1896, Leeds: Club Patients at the Infirmary; Failure of Former Efforts to control Club Work; Malingering; Methods of Competition; "Six-penny and Shilling Doctors"; "One Mark" Vaccination; West Wiltshire and Surrounding Districts; Lincoln Medical Protection Fund.

of encouraging the formation of medical unions, not only in other parts of Belgium, but in various other countries. What, on the other hand, has been its effect on the benefit societies? They have managed to hold together in a lame and weak manner. The process of disintegration has commenced. A medical service with makeshift medical officers cannot last for ever. The Federation of the Brussels Mutualists has hunted far and wide to find medical men to take up the work of the twenty practitioners who are on strike. In their distress they accepted the services of the first-comer. One of the medical men they engaged proved to be an inveterate drunkard, and there were so many complaints made against him that the Mutualists had to dismiss him after a short term of service. Another of their medical officers was found so incapable that he had also to be discharged. The Federation had likewise secured the services of two medical men from the provinces. One had not practised for twenty years and the other was half paralysed. The latter employed a young assistant, who, however, came to the Medical Syndicate and offered to leave his employment at once if some other occupation could be found for him. Another medical man in the service of the Federation of Mutualists had been expelled from his university and was hiding himself in a little village abroad where the officers of the Federation went and fetched him to help them to resist the medical strike. They further secured the services of a medical man who had stolen instruments when at college and was consequently boycotted by his fellow students. Such is the style of black sheep who are willing to act against the interests of the profession and take the place of the devoted men who are on strike. Still, there were some exceptions; here and there the services of a really competent and respectable medical man were obtained. Such was the case last August, when, as described at the time, the munificent salary of 4000 francs was paid to their chief medical officer, though previously to the strike the highest salaries given by the Federation only amounted to 1700 francs. It will be remembered that a dead set was made against this medical officer by the Medical Syndicate. He was cut wherever he went. Medical men refused to be in the same room or café with him. He was driven out of the Civic Guard because the whole medical staff threatened to resign if he was not called upon to quit the corps. The result was that the medical man in question had to give up his post as medical officer of the Federation, had to apologise to the Medical Syndicate, enroll himself in the union, and pay towards the maintenance of the strike he had at first attempted to thwart.

Since then the Mutualist Federation have secured the services of another very good medical man. It will be readily understood that, so long as the Federation of Mutualists can only obtain the services of medical men of dubious character and doubtful capacity, the process of disintegration already begun will progress more and more rapidly. The fact that respectable physicians will not serve these benefit societies is in itself the best of object-lessons for the public. Naturally the Mutualists themselves do not care to be attended by the tag-rag and bob-tail of the profession. Thus it has come about that though the twenty competent and respectable medical officers employed by the Mutualists before the strike were fully occupied, now that they have only ten medical men at their service, these ten men have not enough work to do. Thus the medical service has broken down to the very great dissatisfaction of the members of the benefit societies. But there was, nevertheless, one really competent man, and he organised the work of the other less competent officers. Again the Medical Syndicate had to set to work and get rid of this second and grave obstacle to the success of their movement. Fortunately for them, the medical officer in question fell ill. The complaint was of so serious a character that he had to call in one of the principal professors of the Brussels Medical School. The professor tended him with care and succeeded in restoring him to health; but he did not fail to profit by the opportunity thus obtained of exercising due pressure. "I have cured you of your physical ailments," said the professor; "it is now your turn to effect your own moral cure. If you want to see me again you must first do your duty to your fellow medical men by leaving the Mutualist Federation and joining our union." The lesson went home, the medical man in question gave in his resignation, and thus the Federation has lost the second really competent medical officer they have been able to enroll since the commencement of the strike.

Apart from the fact that they cannot secure the services of efficient medical officers there are other circumstances that are daily tending to weaken the position of the Mutualist Federation. It will be remembered that they derived a considerable income from what was called the Popular Pharmacies. The organiser of these pharmacies, nine in number, had obtained a guarantee fund from the friendly societies and entered into a sort of partnership with them. The public, deluded into the belief that the drugs sold at these popular pharmacies were cheaper than those to be obtained at ordinary dispensing druggists' shops, bought largely. It was from the sales to the general public that the profits were obtained. Under the pretence of coöperation and mutual aid a general and ordinary business had been established. The dispensing chemists naturally complained against this state of things, and an agitation ensued which resulted in the enactment of a law which renders it illegal for coöperative societies to sell to others than their own members. This at one blow destroys the popular pharmacies and dries up a large source of income for the benefit societies. One small society, for instance, I am told received as much as five francs per member as its share in the profits of the popular pharmacies. This is much more than is paid for the medical service. But no profits were made out of sales to members, it is only from sales to the general public that the great benefits arise, and this sale is now rendered illegal.

But more useful far than this law is the coöperation of the Socialist party with the Medical Syndicate. Yet the medical strike placed the Socialist party in an extremely difficult position. It is calculated that one-third of the Mutualists are Socialists. The leaders of the Socialist party fully understood that the Medical Syndicate was only seeking to do for the medical profession what they had done for many classes of working men. Several medical men also are active members of the Socialist party. The most renowned of the Belgian Labour leaders and political economists was a medical practitioner, the late Dr. Cesar de Paepe. To him is due the credit of having first opened classes for the training of nurses where formerly there were only untrained sisters of mercy. Those medical men who have been employed by the Socialists have had no complaint to make, but the difficulty rests in the fact that the Mutualist movement was started many years before the Socialist movement. The medical aid organised in conjunction with the great coöperative societies founded by the Socialist party was based on the payment of 5c. per week per head. This makes 2fr. 60c. per annum and per member, whereas the Mutualists only pay 2 fr. per annum per family. Socialists who did not already belong to the Mutualists readily subscribed to these terms, and to meet their needs five medical men are employed by the Socialist party of Brussels on terms that are satisfactory both to the medical men themselves and to the Medical Syndicate. But it was hardly to be expected that those Socialists who had subscribed for years to the Mutualist societies, and had acquired vested interests, should abandon these advantages to join the Socialist medical aid organisations, where they would have to pay higher subscriptions. Several commissions have been appointed to study this complex question, and as it is impossible to harmonise these interests a bold and new policy has been adopted. But so that this new departure may be properly understood it is first necessary to explain that the Maison du Peuple—that is, the Socialist Productive and Distributive Coöperative Association—has now enrolled in Brussels alone no less than 12,000 families. They produce 140,000 kilogrammes of bread per week; their coal trade necessitates the employment of quite a squadron of horses. The actual Maison du Peuple is altogether too small for their dry goods stores and their multifarious businesses. Consequently new premises are to be built and a site for this purpose has been purchased on a new thoroughfare. The land alone cost £40,000. The principal architect of the town, M. Horta, has been employed to design an artistic façade, for the Socialists have determined to spare no expense so as to win the prize the town has offered to those who construct the best or most handsome frontage on the new thoroughfare. This great building will be finished next year. In the new Maison du Peuple a surgery, consulting and waiting rooms, furnished with every appliance and convenience will be provided. Here medical men will be in attendance at fixed hours and every member of the Coöperative Association will have the right to receive whatever relief he may need. The vexed question of the subscription to be paid has been solved by the very radical

measure of abolishing subscriptions altogether. The cost will be defrayed out of the profits of the coöperative business. Thus every coöperator by the purchases he makes will help to pay the medical staff and the other attendant expenses; therefore, the Socialists who belong to Mutualist societies need no longer continue their payments for medical aid, since they will be able to obtain this aid without payment at the Maison de Peuple.

This arrangement might certainly occasion various abuses. The medical men may be overworked and wealthy coöperators may avail themselves gratuitously of their service. But measures have been taken to ward against these dangers. First of all, the medical men in the employ of the Maison du Peuple belong to the Medical Committee, and themselves decide how this medical service shall be organised. They are also to a man members of the Medical Syndicate; and to make sure that the medical officers of the Maison du Peuple shall do nothing against the interests of the medical profession it has been decided that a delegate from the Medical Syndicate shall sit on the Medical Committee of the Maison du Peuple. The secretary of the Medical Syndicate has expressed his complete satisfaction with this arrangement, and recognises that the salaries the Socialists will pay their medical men are amply sufficient. Also these latter are active members of the Labour Party, and will not only have every opportunity of defending the interests of the profession within its ranks, but have done, and will do, much to win over the sympathies of the working classes for the medical profession in its present economic struggle. Already three of the Mutualist societies have left the Mutualist Federation and come over to the Medical Syndicate asking the medical men themselves to organise their medical aid service. This has been notably the case with one society numbering 500 members, and since they have left the Federation their membership has considerably increased.

The Medical Syndicate has adopted a rule to the effect that no medical man shall serve a medical aid organisation without first submitting the rules of that organisation to the Medical Syndicate. To prevent the abuse of such associations by the wealthy a very simple but effective measure has been enforced and with great success. The medical officer must refuse to attend any member of his society who can afford to pay a proper fee, unless, of course, the fee is forthcoming. Should the patient refuse to pay the usual fee on the ground that he is a member of a benefit society his name is at once communicated to every member of the profession throughout Brussels, and they are all bound to refuse to attend this patient excepting as consultants. This rule was recently applied to a millionaire who sent for his club practitioner. The latter refused to attend to him at club rates and demanded full fees. The millionaire then applied to a number of other medical men, but they all refused to attend except as consultants and in conjunction with the club practitioner. The millionaire, therefore, had to be content with his club practitioner and had to pay him full fees. In this manner wealthy people will be struck off the lists of medical aid organisations. The Medical Syndicate also requires those Mutualist societies which have left the Federation and come over to them to supply every year a full list of their members. This list is carefully examined and the names of all persons who can afford to pay medical fees are struck off. The three Mutualist societies who have abandoned the Federation have assented to these terms.

It only remains now to add that at Namur, at Liège, at Charlerei, at Mons, and in the suburban districts of Brussels other medical syndicates or unions have been formed after the model of the Brussels syndicate. Further, it should be mentioned that the hospitals have been appealed to with some measure of success. Steps have been taken so that these institutions should not help the Mutualist Federation to resist the strike by giving medical aid to the members of the Mutualist societies.

People who belong to clubs have no claims on the public charities. As the staff at the hospitals are all members of the Medical Syndicate they are anxious not to do at the hospitals the work of the Mutualist Federation. Thus it will be seen that the members of the Brussels Medical Syndicate have fought the battle along the whole line, have neglected no detail, and have given proof of the very greatest unanimity and discipline. By the perfection of their organisation they have set an example to the whole of Europe. Their fight has already lasted twelve months, and they are stronger, more numerous, richer, better disciplined and more unanimous than when they began. The hard-won experience the Brussels Medical Syndicate has so gloriously acquired will be of inestimable benefit to the medical profession in every part of the world.

MEDICAL AIDS AND INSURANCE CANVASSING.

To the Editors of THE LANCET.

SIRS,—I hope you will spare me a few lines in your valuable journal that I may again ventilate a crying evil which is going on daily in our profession unnoticed, or rather unpunished, in connexion with medical aids and insurance canvassing. In this district insurance canvassing is rampant: in fact, insurance brass plates seem more numerous than medical men's plates. I practised in Glasgow some ten years, and during part of that time was medical officer to lodges of both the Foresters' and Oddfellows' societies, and of such I do not think anyone in the profession can complain. They are very valuable institutions, if only for the *esprit de corps* they maintain among their younger members; besides, they make a fair and square bargain with their medical man, and do not canvass at the houses of other practitioners' patients. Now canvassing is the main and most disgraceful feature of the insurance business. The agents go from door to door indiscriminately canvassing for certain medical men (it depends on the section of the district which practitioner is recommended); unsuccessful at first, they renew the attack again and again. Three patients last week told me they had been besieged by "insurance men" canvassing for Dr. So-and-so; two withstood the attack, but one shyly confessed she had succumbed—that is to say, if she is to get the full benefit for the money paid she must leave her own medical man and attend the insurance one. Remember, the people that all this is going on amidst are not the very poor or even the better class of artisans, but people living in houses of £30, £40, and £50 rental. I had recently a call from an insurance agent who boasted of having "set up" two medical men here, and then he had the effrontery to offer to sell me one of the practices for £100, and "I should have the chance of a cheque now and then from the office." Of course, I showed him to the door, but it makes one blush to think that there are members of the profession who stoop to place their necks under the heels of such men, for the medical practitioner comes in the end to be really at their mercy; they can make or take away his practice, such as it is. I do wish and hope that a few influential members of the profession, who are removed from any interested motives save that of seeing justice and fair-play meted out to their brethren whom this wretched system hits so hard, would get up a monster petition to the General Medical Council asking them to consider seriously and to try to find a remedy for this gigantic evil. The present is a very opportune time for agitating on this subject, seeing the practitioners will soon be electing their representatives.

I am, Sirs, yours truly,

WM. J. COLLYER-ADAM, M.B., C.M. Glasg.

Acre-lane, Brixton, S.W., June 29th, 1896.

THE COVENTRY PUBLIC MEDICAL SERVICE.

To the Editors of THE LANCET.

SIRS,—Noticing in your journal the frequent accounts of the "Battle of the Clubs," I thought it would not be out of place for me to give you a short account of the workings of the Coventry Public Medical Service, the third annual meeting of which has recently been held. Three years ago Coventry was in the anomalous position of having nearly 26,000 people in a provident dispensary out of a population of 52,000. This dispensary had no wage limit, and apparently anyone applying for admission was taken in at the following rates: adult members and others over twelve years of age paid 1*d.* per week, the first four children paid ½*d.* each per week, and any others (under twelve years) were accepted without further payment, so that father, mother, and all children under twelve years were accepted for the low fee of 4*d.* per week. For this medical and surgical assistance with medicines were to be supplied. The annual report for this dispensary for 1892 showed that the contributions of the members amounted to £2907 1*s.* 8*d.*, out of which the medical officers were paid the sum of £1723 4*s.* 5*d.*, leaving £1183 17*s.* 3*d.* to be spent in expenses. A rule existed in this dispensary that the medical men attached to it should not meet in consultation other practitioners in the

town upon dispensary cases, which rule was obviously unfair to the patients and the other medical men. In addition to this dispensary, private clubs and benefit societies existed.

In order to substitute a more satisfactory state of affairs a public medical service was established on May 1st, 1893, and all the medical practitioners in the town were invited to join, two only holding themselves aloof, with the exception of the six dispensary men. I might add that the dispensary men were very cordially invited to join, but refused, their great objection seeming to be the fear that other men would be imported into the town. One of the objects of the Public Medical Service was to sever connexions with medical aid associations and do away with the few private clubs existing, at the same time giving the druggists of the town the dispensing. The National Medical Aid Association was first relinquished, and immediately that society sent a qualified medical man to reside in Coventry and take over the work. A large branch of the Star Benefit Society was next relinquished and was promptly taken over by the dispensary. The public medical service was started by each of the eleven medical men subscribing two guineas as a guarantee fund, a collector was appointed who was forbidden to canvass, patients were to pay 1*d.* per week for each member (child and adult), a wage limit of £2 per week was to be strictly enforced, and the druggists of the town were to do the dispensing. The guarantee was returned at the end of the first year, since which time the service has been able to pay medical man 2*s.* 6*d.* per case per annum and 1*s.* 10*d.* for dispensing, printing, and other expenses. The number who have joined has been far in excess of the expectations and at the present time the medical men attached to this public medical service have nearly as much contract work as they have time to undertake. It has been stated that it would be impossible to start a public medical service without subscriptions, but I would like to point out that this service was started entirely without outside support; no money was subscribed except by the medical men attached to it, which, as I have before stated, was returned at the end of the first year. Since then there has always been a balance in the hands of the treasurer.

In conclusion, I think that you will agree with me that if other towns were to adopt such a course as Coventry we should hear less of the "battle of the clubs," and there would be no need for medical aid associations and cheap dispensaries.—I am, Sirs, yours faithfully,

EDWARD PHILLIPS, M.B. Durh.,
Hon. Secretary to the Coventry Medical Service.

Coventry, June 29th, 1896.

P.S.—Perhaps it would be well to state that the Coventry Provident Dispensary is still conducted on the same lines as formerly and there is no wage limit.

MEDICAL PRACTICE BY CONTRACT AS VIEWED IN CALIFORNIA.

If our medical societies do not mind they will be forestalled in their protest against an increasing evil by the Californian State Medical Society in Los Angelos. The *New York Medical Record* reports that at a recent meeting of this society a resolution was introduced to the effect that in the opinion of the society it is contrary to the spirit and letter of the code of medical ethics to perform contract lodge practice, and that in the future no physician be admitted to membership who holds such a position, and that members who may now be thus engaged be warned that a renewal of their contract will be construed as contrary to the spirit of the resolution. The executive committee, to which the matter was referred, have reported favourably on this resolution, which will be presented to the society at its next meeting. The resolution goes further than we should expect societies to go in this country. But undoubtedly contract medical practice needs to be checked and curtailed instead of extended to new classes, as has been done lately amongst us.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

Oil Lamps.

THE numerous accidents which have occurred from the use of imperfectly made and defective lamps has at length been made the subject of Government enquiry by a select committee on petroleum oil and lamps. As a result of the conferences held in this town and in London an organisation has been formed called the Lamp Trade Association. One of the objects is to restore the confidence of the public in oil as an illuminant and as a cooking and heating agent. The association is preparing to send out large quantities of printed matter bearing upon the character of petroleum, together with full instructions for the proper use of lamps. It is also prepared to communicate with coroners whenever fatal accidents arise from the reckless use of lamps, and to send a representative to investigate the cause of such accident and to give evidence before the coroner.

Women Guardians.

An active society exists for promoting the election of women guardians. At a meeting lately held the opinions of various members found vigorous expression. Bearing in mind that the large majority of those dealt with by the Poor-law are women and children it seems reasonable that competent women should take a share in the administration of relief and management. Before the passing of the Parish Councils Act there were 130 women guardians in the country; now there are nearly 800. In Birmingham there are at present only two women on the board. The number of paupers, including the Workhouse Infirmary and the Marston-green Homes, is 2400; of these the greater number are women and children. There are also nearly 100 nurses who require supervision. The girls sent out from the homes to situations also should be superintended and their interests looked after. On these grounds the association determined to appeal to the ratepayers and are sanguine in the hope of making their arguments successful.

A "Rotten Row" for Birmingham.

The City Council are to be presented with a memorial in favour of a "Row" being made in Cannon Hill Park for those who favour horse exercise as a means of promoting health and recreation. The memorial has been largely signed, many professional men taking an active interest in the endeavour to obtain a clear course for their favourite pursuit.

Cool Beds for Summer.

I may note a useful suggestion of a practice which is said to be in common use in Florida and other parts of America. A vessel or pot of metal, much in the form of the ancient warming-pan, is filled with broken ice; the vessel is placed between the sheets and moved to and fro over the surface of the sheets and pillows until they are quite cold. This cooling is very soothing and induces immediate sleep. In insomnia and a variety of conditions the experiment is worth trying; it is said to be grateful and refreshing.

July 1st.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

A Lost Opportunity.

BY its masterly indecision and procrastination the Manchester corporation has lost the opportunity of acquiring Trafford Park. It has lost the three and a half miles of frontage to the Ship Canal which in a short time will be of untold value—more than enough, in all probability, to have paid for the whole of the property; it has lost the many hundreds of acres of park land which would have been an invaluable open space to a densely populated city, and as the guardian of the public health has been guilty of a grave dereliction of duty; while, in the opinion of many cool and capable business men, it has committed a gross commercial blunder. The sale includes the minerals beneath the park, and the chairman of the purchasing syndicate has stated that the coal is worth £120,000, so that it may be anticipated that the coal-mining industry will soon add to the beauty of the neighbourhood. This syndicate, as is well known, has recently carried out enormous operations in cycle companies, and the chairman has said: "We intend to build, for instance, cycle and rubber works, for which there is an excellent frontage"; and he has spoken also of bringing down 10,000 workpeople, who will require houses and make, with their wives and children, a town of respectable size. This is just to begin with. How much of this statement may be the outcome of the

exhilaration not unnatural in one who has so signally achieved success in making the Manchester corporation—with its special committees and all its other paraphernalia of delay—look ridiculous remains to be seen; but for those who realise the severity of the blow, either from the sanitary standpoint or from that of regard for the reputation of the council for intelligence, the situation is depressing. When asked if the syndicate proposed to reserve any part of the timbered estate for the purposes of a park the chairman is reported to have said: "We do not wish to pose as philanthropists, but we know very well that the land will be worth more if there is a lung in the centre of it. We are not antagonistic to the Manchester corporation, and if they like to make us an offer or to approach us we shall be prepared to reserve a portion for public purposes." Poor corporation! What a delightful feeling it must be to have the whip hand of it and to be the possessor of a fine commercial instinct.

Fruit in Manchester.

One of the points as to which we have improved on the dietary of our forefathers is in the greatly increased consumption of fruit, and our Shude-hill market is one of the largest centres in the kingdom for its reception and distribution. It is said that except Covent Garden no other receives and distributes every day so many hundred tons of ripe produce, "and it is doubtful whether even Covent Garden will this year equal the Manchester centre in quantity." Oldham, Bolton, Stockport, Blackburn, Ashton, Hyde, Bacup, and other populous towns receive their main supply from Shude-hill. During the last few years the acreage under strawberries has greatly increased. It is not long since our supplies came almost entirely from Kent, but now Sussex, Hants and Cambridgeshire, Hereford and Worcestershire, together with what we may call the home county of Cheshire, all join in pouring in their contributions. The fear of rain last week led to busy gathering, and on Wednesday last no fewer than four special trains laden with strawberries reached Manchester, so that in the afternoon and evening vast quantities were seen on the street barrows. But not only from the favoured districts of England do they come, but from Scotland, for on the same day about a thousand baskets of strawberries arrived here from Blairgowrie. Other fruits come in like proportion, but tomatoes show even more than strawberries the wonderful growth of the new appetite for wholesome fruit. A dozen years ago a basket of tomatoes would have caused some excitement in the market; now heaps of baskets are stacked everywhere. This year two special steamers run daily to Southampton and Weymouth to bring over the thousands of tons sent from Guernsey, to be distributed all over the country, and of these Manchester has a share. On Wednesday last at least 5000 baskets, each containing 12 lb., were received in the Manchester market. Consignments of 4000 baskets are quite usual. Being quickly perishable, these fruits come chiefly by rail, but the Ship Canal does good service in helping forward our vegetable supplies, as potatoes and onions, and also in bearing cargoes of oranges, so that they are no novelties to the poorest of the population. No doubt we as a people eat too much meat, and it is a national benefit for our towns to have ample supplies of fruit and vegetables.

Victoria University.

Degree day was celebrated on Saturday at the Free Trade Hall. As in the older universities, noisy demonstrations by the students were not wanting, and the presentation of degrees was witnessed by a large number of ladies and gentlemen. "The members of the Board of Studies, the Court of Convocation, followed by the pro-Vice-Chancellor and the Chairman of the General Board of Studies, with the Vice-Chancellor and Registrar bringing up the rear, made an imposing procession as they left one of the ante-rooms attired in their hoods and gowns of diversified colour." Manchester is rather a sad-looking city, and a little spectacular display so respectable and academic is quite cheering. Dr. Ward said it had been thought well to provide that, if possible, in future the Vice-Chancellor's two years' tenure of office should terminate, as a rule, early in the Michaelmas term, instead of, as hitherto, in the middle of the Easter term, and that to facilitate the change he had again accepted the honour of re-election, and that this was therefore the last annual degree day on which he was likely to perform the most gratifying of the functions belonging to his present position. As to members, he did not fear any falling off, the candidates to be presented being 122 as compared with 118 in 1895 and 115 in 1894. "In the Faculty of Medicine we may probably look for a speedy recovery of the slight diminution experienced during the last two sessions in the number of graduates; but this the results of the July examinations will show." He adverted to the installation on the previous day of the Prince of Wales as Chancellor of the University of Wales, when the honorary degree of Doctor of Laws was conferred on Lord Spencer, the Chancellor of the Victoria University, and said that "by his acceptance of this honour Lord Spencer testified to the cordial goodwill cherished by the Victoria University towards the youngest of her sisters." The following gentlemen had the degree of M.D. conferred upon them:—K. A. Beaver, Univ.; J. L. B. Dixon, Owens; R. W. Marsden, Owens; H. T. Nixon, Univ.; and J. C. Thresh, Owens. Dr. Thresh, who is well known as the medical officer of health of Chelmsford, received the gold medal for his dissertation for the M.D. No ladies were added to the ranks of the medical graduates, but one became a Master of Arts and several were made Bachelors.

Hospital Sunday and Saturday.

A meeting of the general committee of these funds was held yesterday. There was a good attendance, including (for the first time) a number of the members of the Red Cross Society, representing the workpeople. It was stated that in nearly all the cases where the system of periodical collections advocated by this society had been adopted the result had been an increase of contributions, and as the system had only been at work four months, and in many cases only two or three months, a much better result may be looked for next year. It was also said that many churches in the district do not contribute offertories to the fund, and a special committee was appointed to look into the matter and report. The meeting authorised the apportionment of £7500 to the various hospitals.

Action for the Recovery of Fees.

On Saturday last an action of interest to our profession was tried at the Salford Hundred Court of Record. It was brought by Dr. J. B. Brierley of Old Trafford, nominally for recovery of his fees, amounting to nine guineas, for attendance during a confinement and the subsequent treatment, but also for the more important purpose of defending his professional reputation. The defence was "a denial of indebtedness, that the plaintiff was not engaged for any stated fee, that he had not used proper care, skill, and diligence, and that in consequence his services were of no avail, but, on the contrary, were injurious, and caused the death of defendant's wife." The plaintiff attended the lady in her confinement, and on calling the next day found her in a state of fever and observed symptoms of blood poisoning. This was due, in his opinion, to the insanitary condition of the house. In this opinion he was supported by Dr. Faulkner of Stretford, who saw the patient with him. An attempt was made to show that Dr. Brierley was suffering from blood poisoning at the time of his attendance, but this was easily defeated. Dr. S Woodcock, Dr. A. Ritchie, and Dr. T. A. Helme corroborated the plaintiff's statements, and the jury without leaving the box found a verdict for the amount claimed. The judge said that "an allegation of gross negligence of this kind ought not to be made lightly or affirmed by a jury unless it was proved beyond all question, and although this was an action for the recovery of fees the jury would be mistaken if they attached anything like so much importance to that part of the case as to the other." Mr. Byrne (his counsel) said the plaintiff, in defending his reputation, had been put to considerable expense, and asked that the costs of the medical part of the case should be allowed on the higher scale, which was granted Dr. Brierley is to be congratulated on the result of a case which must have caused him much worry and anxiety.

June 30th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Lecture before the Royal College of Surgeons of Edinburgh.

FOR many years the former custom of giving special lectures before the Royal College of Surgeons of Edinburgh has been allowed to lapse. Latterly, however, at the suggestion of the President, Professor Struthers, arrangements

have been made to revive the custom, and the first of what are expected in future to be several annual lectures by different Fellows was delivered in the hall of the College on the 26th ult. by Mr. Cathcart, conservator of the museum. Mr. Cathcart chose as his subject Classification in Pathology, as applied not only to museums but to the explanation and description of special pathology in lectures and text-books. At the outset the lecturer drew attention to the logical canons of division, and urged the importance of applying them to the formation of groups either for demonstration and exhibition or for description in order to avoid the confusion which follows from a cross division. After discussing the use of "locality," "result," and "cause" as bases of sub-division, he advocated the latter as the basis on which the main groups of disease of different organs should be founded, and explained a special scheme of causes which he had drawn up for the purpose. Taking bone diseases as an example, he pointed out instances of cross division in the classifications employed in certain standard works, and while showing how this source of confusion might have been avoided without greatly modifying the existing method he advocated the introduction of what he thought a better method. The lecturer then explained how the new system would work out when applied to diseases of bone, of skin, and of brain, and concluded by answering certain possible objections to it. The lecture, which contained much original thought, was illustrated by specimens from the museum and by various tabulated schemes thrown on to a lantern screen. Invitations had been issued, also, to the Fellows of the Royal College of Physicians of Edinburgh, and the lecture (which will appear in the *Edinburgh Medical Journal*) was listened to with interest by representatives of both Colleges.

Plumbers' Congress in Edinburgh.

The seventh annual congress of the Scottish District Councils of the National Society for the Registration of Plumbers was held last week in Edinburgh and was attended by about 150 delegates. The meetings were held in the Heriot-Watt College, and an exhibition of plumbers' work and sanitary appliances in the Drill Hall, Forrest-road. The opening of the exhibition was the first function performed in connexion with the Congress. The chair was taken by Professor Crum Brown, while Baillie Pollard, in the absence of the Lord Provost and as chairman of the Public Health Committee of the Town Council, formally declared the exhibition open. In his opening remarks he said that it was a unique fact in the industrial development of their time that one trade, taking an intelligent view of its influence upon the health and even upon the life of the community, had resolved that for its part it should, so far as in it lay, make sure and give public guarantee that the work which the plumber performed should be thoroughly well done. They had come to that resolution under no outside compulsion or any compulsion of law, but from an intelligent view of the importance of their work. In dwelling upon the causes of the lowered mortality in the city he stated that the result had been due to many influences, not the least of which was the improvement in the plumbing trade of the city. The formal opening of the Congress took place in the Heriot-Watt College, Professor Sir Douglas Maclagan occupying the chair. Professor Crum Brown welcomed the Congress in the name of the University. When the Congress met in the afternoon under the presidency of Sir James Russell a report was submitted by Alderman Hind, Stockton-on-Tees, on the position of the Plumbers' Registration Bill. He said they had not been able to carry their measure, but it did not very much matter whether it passed or not if they carried on the work as they were carrying it on in Scotland with such splendid organisation and with such a number of classes training young men technically and practically in their work. If they continued to make as much headway as during the past six or seven years they would make their position clear and strong. The congresses made outside people interested in the work, which was very necessary. The chairman moved that they should petition Parliament in favour of the insertion of a clause in the Public Health (Scotland) Bill, No. 2, to frame and arrange plumbing regulations. The meeting on Friday was also presided over by Sir James Russell, and the first motion, carried after considerable discussion, expressed the desirableness of impressing on the registered masters the advisability of employing only registered men. Professor Crum Brown opened a discussion on the prevention of freezing of water pipes. Various other papers of more or less technical interest were read. On Thursday afternoon the Lord Provost and magistrates gave a reception to members of Congress. On Friday evening the annual dinner took place at which the Lord Provost presided, and Saturday was devoted to sightseeing.

Addition to Dumfries Infirmary.

The directors of this institution have arranged for an addition to be made to the building at a cost of £3000.

Forfarshire Medical Association.

The annual general meeting of this association took place at Edgell on Thursday, June 25th, Dr. Adam of Brechin, President, in the chair. The members present included Dr. Duncan, Dr. Anderson, Dr. Halley, Dr. Buist, Dr. Larbalestier, Dr. Guild, Dr. Graham Campbell, Dr. Rorie, Dr. McGillivray, Dr. Johnston, and Dr. Peter Campbell (Dundee), Dr. Stone, Mr. Urquhart, and Mr. Gunning (Montrose), Dr. Howden and Dr. Havelock (Sunnyside), Dr. Grant (Glamis), Dr. MacAlister (Forfar), and Dr. Parkinson (Brechin). Apologies for absence were intimated from Dr. J. W. Miller (Dundee) and Dr. Lawrence (Montrose). The minutes of last meeting having been read and approved of, the treasurer submitted the financial statement, which showed the affairs of the association to be in a satisfactory condition. It was arranged that the next general meeting should be held in Montrose. The following office-bearers were elected for the year: President, Dr. D. Johnston (Fordoun); Vice-Presidents, Dr. Beattie Bain (Dundee) and Dr. Gowans (Broughty Ferry); Council; Dr. Sinclair, Dr. Mackie Whyte, Dr. Mackay, Mr. Steele Moon, Dr. Johnston, and Dr. Tulloch. Secretary: Dr. Peter Campbell. Treasurer: Dr. McGillivray. Local Secretaries: Mr. Cable (Forfar), Dr. Adam (Brechin), Dr. Key (Montrose), and Dr. Laing (Arbroath). The secretary made a statement with regard to the part taken by the Association and its council in bringing before the Cobb trustees and the general public the necessity for a maternity hospital in Dundee and intimated the receipt of £5000 by the Association from the trustees for this purpose. It was proposed by Dr. Peter Campbell, seconded by Dr. Rorie, that the money given to the association by the Cobb trustees for the purpose of establishing a maternity hospital in Dundee be handed over to the maternity hospital committee. Dr. McGillivray moved as an amendment that a special meeting of the Association be held in Dundee to consider the matter. This was seconded by Dr. Buist and carried by 7 votes to 6 for the motion. Dr. Buist gave notice that at the next meeting he would move that members present at the annual meeting shall each year select the locality for the succeeding meeting. After the business was over the members dined together in the "Panmure Arms" hotel.

Hospital Saturday in Aberdeen.

June 27th was Hospital Saturday in Aberdeen. The movement, which is new in the city, originated with the friendly societies, and it was arranged that the proceeds should be for the benefit of the Aberdeen Royal Infirmary, Aberdeen Royal Hospital for Sick Children, and the Aberdeen Hospital for Incurables at Morningfield. Duthie Park was placed at the disposal of the committee for the afternoon and evening by the town council, which enabled a charge of 6*d.* for admission to be made. An effective procession took place from the Reclaimed Land to the park, the persons taking part being on foot, on horseback, and in vehicles. The various lodges of Oddfellows, Foresters, Rechabites, Free Gardeners, Shepherds, &c., displayed their fine banners, and the strains of numerous bands beguiled the way. A circuitous route was selected so as to include parts of some of the principal streets, and contributions were taken up on the way in collection boxes. The gala in the park included a long programme of athletic contests, concerts, dancing and other amusements. There was also a drawing in connexion with a subscription sale, for which nearly 53,000 penny tickets had been disposed of. The weather was sultry but only one thunder shower fell, and for hours there was a continuous stream of visitors by all the entrances to the spacious park. No intoxicants were sold, and although the attendance was above 20,000 the behaviour of the people was admirable. The sum of £900 or thereby has been realised for the medical charities named.

July 2nd.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Delegates to the Sanitary Congress.

AT the last meeting of the Commissioners of the Pembroke Township Sir R. W. Jackson and Dr. J. J. Cranny were appointed delegates to the Sanitary Congress, which will meet in September at Newcastle-on-Tyne.

The Banquet to Mr. Kendal Franks.

The medical event of the week in Ireland has been the banquet at the Royal College of Surgeons on June 25th given by his professional friends in Dublin to Mr. Kendal Franks, Vice-President of the College. The entertainment was intended as a farewell to Mr. Franks on his departure to South Africa, necessitated by the ill-health of his wife, who has been obliged to reside permanently in a drier climate. It is not too much to say that no stronger spontaneous expression of good-will, no more remarkable testimony to the high esteem in which he has been held by his professional colleagues, and to his purely personal popularity has ever been bestowed on a Dublin surgeon than that which has just been offered to Mr. Franks. The assemblage that greeted him on Thursday evening was distinctly representative of his profession in Ireland and the banquet was an unqualified success. Amongst the guests, Field-Marshall Lord Roberts, in responding to the toast of the Army and Navy, took advantage of the occasion to reiterate the opinion which he had already recently expressed at the recent Guy's Hospital dinner in the presence of His Royal Highness the Prince of Wales, that the medical officers of the army should be the very best that the profession could provide. He could easily tell them, he said, of the heroism and courage which he himself had seen displayed by army medical officers; he admired their devotion and duty, and some of his very best friends were amongst the medical officers of the army. Another guest, the Lord Chancellor of Ireland, in responding to the toast of "The Irish Bench," said, among many eulogistic remarks of his friend Mr. Franks, that he knew of no man more popular or who had enlisted about him more kindly and sympathetic emotions. It was very hard, he said, to reach a position of success and eminence in a profession without kindling some sense of jealousy, some feeling, it might be, of question as to success; but all agreed in this, that Mr. Franks had won his way fairly and honourably amidst the generous and noble rivalries of a great and learned profession.

The Prevalence of Rabies in Ireland.

A circular has been sent from the Veterinary Department, Privy Council Office, Dublin Castle, to the Belfast board of guardians stating that in every doubtful case of rabies in a cat or dog the existence of the disease should, if possible, be verified by a special experimental investigation, and that in future this investigation would be carried out in Dublin at a greatly reduced cost to the local authority by Mr. A. C. O'Sullivan, Lecturer on Pathology, Trinity College. A fee of 10*s.* 6*d.* would be payable to the local authority, and one-half of that would be repaid in each case to the local authority by the department. The investigation will be of great value in settling the question of the existence of rabies in doubtful cases.

The Removal of Sick Paupers from the Belfast Asylum to the Workhouse.

On June 23rd, at an inquest held in reference to the death of a man who was removed from the Belfast Asylum on Feb. 28th, 1895, and died on June 18th, 1896, in the Belfast Workhouse Infirmary, where he had been sent by the asylum authorities, the coroner dwelt on the fact that the patients usually sent to the workhouse from the asylum were aged and broken-down people in delicate and sometimes in a dying condition, which he thought was a cruel and inhuman practice. He thought it was a simple way of decreasing the death-rate of the asylum and increasing it in the workhouse. The jury returned a verdict to the effect that the man came to his death in the lunatic department of the Belfast union workhouse from nervous exhaustion, and that his transfer from the district asylum contributed to the hastening of his death, and that the case was not a proper one for a transfer; and they condemned the system that allowed such transfers, and that if the law allowed such an amendment is needed fo the protection of the insane poor.

The Forster Green Hospital.

On June 27th Mr. and Mrs. Forster Green entertained a very large number of friends at a garden party at Fortbreda, the site of the new hospital for phthisis, which will be ready for the reception of patients about the beginning of 1897. The situation of the new hospital is an admirable one, a slight elevation (the soil being sandy) on the south side of Belfast, a few minutes' walk from the termination of the tramway line. This property, the gift of Mr. Forster Green, Belfast's most generous philanthropist, cost more than £11,000 after providing a sum to cover the head rents. The residence will be considerably altered and new additions will be made to the old building. The grounds in which the new hospital will be situated cover an area of forty-two acres, and it would be difficult near any large city to find a more suitable place for the purposes of a hospital and sanatorium for phthisis. Mr. Forster Green has stated that his idea was to establish an institution for the "furtherance of a long-cherished wish to make some substantial addition to the means of alleviating sufferers from chest diseases in our city" (Belfast). The garden party was most successful, and those present had ample opportunity to see in what a suitable place the new hospital for phthisis will be.

Should Patients Suffering from Chronic Bright's Disease Ride Bicycles?

Last week the sudden death of Mr. Fitzgibbon, managing director of the Munster and Leicester Bank, whilst cycling caused universal regret at Cork. The incidents connected with his death were somewhat remarkable. He was suffering from chronic Bright's disease, but, apart from the urinary indications, was apparently in good or even robust health. He was at business every day, and discharged his arduous duties to the satisfaction of all concerned. At three o'clock on the afternoon of his death he went to his seaside residence at Crosshaven, and two hours afterwards went out on his bicycle. A little later he passed two constables, to whom he wished to speak about an opera-glass he had lost, but explained to them as he rode slowly by that he was unable to dismount, and the constables remarked that he seemed to have a difficulty in working his machine. A little farther on he was found by a boy lying on the road beside the bicycle and struggling to get up. He asked the boy to search for his wrench, which he said he had lost, but the boy pointed out to him that he held it in his hand. In a few minutes some men arrived, who raised him, but his lower limbs were incapable of supporting him. He then vomited, lapsed into unconsciousness, and in a very short time was dead. An inquest was considered unnecessary, but a rather unpleasant incident occurred in connexion with the case. One of the Cork newspapers mentioned that a medical man who happened to be in the neighbourhood saw Mr. Fitzgibbon whilst he was unconscious and after a short delay left him. Of course, the public with insufficient information before them freely censured the medical man. But the medical man explains that he had no means at hand for resuscitating Mr. Fitzgibbon; that he hurried to report the matter to the police and told them he would be at the adjoining hotel, where he thought the police would bring the patient, as he believed him to be a stranger in the locality. Anyone who knows the medical man is aware that he could not be wilfully guilty of any unkindness to a patient.

June 30th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Medicine and Superstition.

ANYONE who is acquainted with the lower stratum of Parisian society will acknowledge that a knowledge of medical terms and of their signification is much more rife in this city than in London. Such technical terms as "arthrite blenorragique," "lymphangite," "pleurésie avec épanchement," &c., are constantly heard issuing from the lips of working people. But that there remains some considerable superstitious credulity in the minds of members of this class is proved by the frequent recurrence of such astounding

occurrences as the one detailed below, the account of which I purposely refrain from translating:—

"Un traitement des tumeurs du bras non prévu par les traités de chirurgie. C'est une brave concierge qui expose la recette devant le tribunal où elle poursuit l'auteur pour escroquerie. 'Mon mari et moi nous sommes allés consulter Madame. Elle a examiné le bras de mon mari; elle a fait dessus des signes de croix en prononçant des mots latins.' Le president: 'Lesquels?' Le témoin: 'Je ne pourrais vous dire au juste...Roupioupiou ..tralala...badaboumorum.... Quelque chose dans ce genre-là. Ensuite elle a percé la tumeur avec une aiguille. Pendant l'opération elle faisait tenir à mon mari un poireau cuit dans sa main droite et une chandelle allumée dans sa main gauche. Ce n'est pas tout. Elle a ordonné de graisser chaque matin la tumeur avec une pommade et de laver le bras avec du sang de lapin.' Le président: 'Et votre mari a été guéri?' Le témoin: 'Non, monsieur. Il a fallu le conduire à l'hôpital où il est encore.'"

Bacteriology in the Provinces.

The newly-elected Academical Council of Paris has just adopted a proposal advanced by its predecessor to organise bacteriological laboratories in several provincial towns.

Diphtheria Statistics at the Children's Hospital.

Dr. Sevestre has recently[1] communicated some interesting figures relative to the cases of diphtheria treated during 1895 at the Hôpital des Enfants-Malades. In the course of that year 1140 children were admitted with the probable, but not positive, diagnosis of diphtheria. Of these 158 died, giving a mortality of 13·85 per cent. Deducting 71 who succumbed within twenty-four hours of their admission, we have 1069 with 87 deaths, or a death-rate of 8·13 per cent. The cases of pure diphtheria without any other microbe than Löffler's were 392 with 39 deaths, or a mortality of 9·94 per cent. Deducting here, again, 23 deaths which occurred within twenty-four hours of admission, the rate is reduced to 4·33 per cent. Diphtheria, with associations of microbes, numbered 486 cases, giving a mortality of 19·34 per cent., or, deducting the fatal cases within twenty-four hours of admission, 12·11 per cent.; in other words, "associated" diphtheria was twice as fatal as the simple variety. Dr. Sevestre is convinced that, contrary to the opinion of several of his colleagues, the association with the specific microbe of the streptococcus aggravates the prognosis. The employment in these cases of Marmorek's serum does not appear to have been attended with success. So long as Roux's serum remains transparent it may be safely used, even though it be old. All Dr. Sevestre's patients were submitted to the usual treatment of diphtheria *plus* injections of Roux's antitoxin, the latter in doses of from 10 c.c. to 30 c.c., according to the severity of the case. In most instances a single injection proved sufficient, the exceptions being croup and very bad throats, where one or two repetitions of injections of 10 c.c. at from twelve to twenty-four hours' intervals were frequently necessary. The supplementary treatment consisted in douching of the fauces with a 5 per cent. Labarraque's solution and in the administration of tonics and suitable nourishment. In certain instances tubage or tracheotomy had to be practised. For the former operation the short tube was utilised, it being more easy of introduction and of removal. In cases of sub-glottic laryngitis, however, the long tube is to be preferred. The tube was kept *in situ* for three or four days, sometimes not so long; in other cases it was left without inconvenience for several weeks. The mortality of croup cases treated without operation was 14·11 per cent., or, deducting those fatal within twenty-four hours of admission, 6·04 per cent. The mortality of children intubated was 27·07 per cent., or, deducting those dead within twenty-four hours of the operation, 17·73 per cent., the corresponding figures for patients tracheotomised after unsuccessful intubation being 87 per cent. and 37 per cent. Dr. Sevestre concluded his instructive paper by stating that post-diphtheritic paralysis seemed to him to be as frequent after the antitoxin treatment as it was before it was discovered, but that the paralysis was of a milder type. M. Netter opines, on the contrary, that paralysis is less frequent than under the old treatment.

Matchmaking and Hygiene in France.

Of late years cases of phosphoric necrosis requiring surgical treatment have become relatively infrequent in the various French establishments devoted to matchmaking—two in 1890, none in 1891, three in 1892, seven in 1893, and three in 1894. Since 1894 every workman presenting the slightest sign of phosphoric poisoning is reported by the medical attendant as affected with incipient necrosis. The sufferer is then at once removed to a distance from the factory and subjected to appropriate treatment, for the most part in the open air, until the absorbed phosphorus has been eliminated. During this period, and pending complete convalescence, the patient receives an allowance for his family. In 1894 fourteen workmen, of whom thirteen came from the factory at Pantin, were found to be more or less affected; but during the first ten months of 1895 the number rose to twenty-five, no fewer than twenty-four being employed at the above-mentioned establishment. The amount expended on sanitary improvements in workshops and the provision of hygienic appliances, together with the ever-growing allocations to industrial institutes, has now attained to the grand total of 1,200,000 francs.

June 30th.

[1] Société Médicale des Hôpitaux, June 19th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Chronic Poisoning by Carbon Disulphide.

DR. STADELMANN, physician to the City Hospital, recently drew the attention of the Verein für Innere Medicin to certain peculiar symptoms observed in workmen employed in india-rubber factories, and he showed three patients who, after having worked for some weeks in those factories, were seized with giddiness, headache, tremors, drowsiness, loss of energy, and gradual impairment of vision. One of them, a man aged twenty-eight years, complained of xanthopsy, and objects moving in the street appeared to him as if seen through a cloud; he also had painful contractions of the muscles and an increasing difficulty in walking or even in standing. Another patient suffered from stammering and fear of walking in the dark, and a third rather remarkable symptom was anæsthesia of certain portions of the skin. All these phenomena were due to carbon disulphide liberated in the factories, and they are quite characteristic, although only a small number of such cases has been reported up to the present time. Some patients declared that their food had a sulphurous taste and in grave cases insanity ensued. Preventive measures had obviously been neglected, and Dr. Stadelmann thinks special regulations very necessary for indiarubber factories. Workmen showing the symptoms above described ought to be at once removed from the unwholesome atmosphere.

The Berlin Royal Institution for Infectious Diseases.

In 1890, when Professor Koch made his sensational announcement respecting tuberculin, a special institution was founded by Parliament, under the name of the Royal Institution for Infectious Diseases, in order that Professor Koch might be enabled to continue his researches on the treatment of such diseases on a larger scale than before, and it was placed entirely at his disposal instead of being controlled by the university, like all the other scientific institutions. It was, in fact, a special hospital in which new methods of treatment were to be tested, and it also contained a large laboratory, provided with every requisite, where not only Professor Koch and his staff, but a number of other medical men carried on scientific work. Temporary premises were erected at great expense near the Charité Hospital, from which patients with infectious diseases were transferred, but as the Charité Hospital, which is the oldest hospital in Berlin, is to be demolished and reconstructed the Institution for Infectious Diseases cannot remain where it is. The Government, however, which in 1890 spared no expense to facilitate Professor Koch's work on tuberculin, seem now to be reluctant to spend much money in this way, and the municipal authorities of Berlin gave an unfavourable reply to a request that they should attach the Institution to one of the municipal hospitals. The Government then announced that the Institution would possibly be removed from Berlin and the town council of Frankfurt offered to provide Professor Koch with ample laboratory and hospital accommodation if he would agree to settle in their city. A change came over public opinion in Berlin when these negotiations were known, the medical as well as the lay press asked the Government to take measures to retain this important establishment in the metropolis, and an arrangement has now been made according to which the Institution is to be attached to the new Berlin Municipal Hospital at present in course of construction. The laboratory department will be built and

furnished by the State, whilst the wards for infectious diseases belonging to the hospital are to be placed at the disposal of Professor Koch by the municipal authority. This arrangement was strongly supported by Professor Virchow, who is a town councillor, and it will undoubtedly have the approval of the medical men of Berlin, anxious as they are not to lose so celebrated a *savant* as Professor Koch.

The Administration of Ovarian Substance for Climacteric Troubles.

Professor Landau has been treating climacteric troubles by the administration of ovarian substance, and an account of his work has been published by his assistant, Dr. Mainzer. The remedy was used not only in pains due to the natural climacteric period, but also in the case of women whose ovaries had been removed by operation, in amenorrhœa from prolonged lactation, and in hysterical subjects. The patients who had reached the climacteric age complained principally of sensations of fulness in the head, occurring many times during the day, pains in the back and legs, &c. The dose varied from a gramme to a gramme and a half (from fifteen to twenty-two grains) administered in the form of tablets containing each half a gramme of the ovaries of pigs or cows. After two or three days the sensations of fulness in the head were said by the women to be much less frequent; within a fortnight they had almost totally disappeared. To avoid the influence of suggestion tablets containing none of the substance were given from time to time, but the symptoms immediately reappeared and the patients felt worse. The effect, however, lasted only while the ovarian substance was being taken; and when it was discontinued the symptoms returned after a time. A remarkable effect of the treatment was that in two cases of amenorrhœa it produced a sanguineous discharge from the genital organs. Professor Landau believes that disorders of the vasomotor system due to extirpation of the uterus or ovaries or to the approach of the climacteric period are benefited by the administration of ovarian substance, that its emmenagogue properties, if any, require further investigation, although it acts as a palliative in primary and secondary amenorrhœa, that its good effects are only temporary, and that in general neurasthenia or hysteria it is inert.

June 29th.

ROME.

(FROM OUR OWN CORRESPONDENT.)

The Maragliano Serum in Tuberculosis.

AN authentic, well-certified case of treatment of tuberculosis by the Maragliano method comes from Spezia. A native of that seaport, Edilio Mercenaro by name and an able seaman by occupation, had since 1893 been suffering from phthisical symptoms, and on examination was found to have both pulmonary apices infiltrated with tubercle. The disease was not largely diffused, but it made steady progress, and by the beginning of 1894 the area of destroyed tissue was considerably increased. Both lungs were very seriously affected and Mercenaro (a young man twenty-one years of age) was placed under Professor Maragliano's treatment in the clinical wards of the Genoa Hospital. The injection of the serum was practised continuously for two months till the close of Professor Maragliano's summer course, by which time Mercenaro had so far improved as to return to his native place. Convinced of the benefit he had received he returned to the ward as a patient in the November of the same year and was once more subjected, under Professor Maragliano's eye, to the serum treatment. The case, though the progress of the malady had been arrested, was still a very serious one, and it was not till the close of July, 1895—eight months from the resumption of the treatment—that substantial cure was effected. Several hundred injections had been practised, and in the latter weeks of the treatment it was evident that Mercenaro was conquering the malady "hand over hand." He left the hospital at the end of July, as has been said, absolutely cured, and since then has for six months been regularly on duty in the service of the Royal navy. At present he is at Spezia, the object of no little professional interest, and described by the physician who last saw him as "sano come pesce" (sound as a roach). Professor Maragliano has no severer critics than among his compatriots, chiefly of the Neapolitan school. But it is fair to add that even in that quarter testimony in favour of his treatment is gaining in volume and authority.

Lightning-stroke.

The thunderstorms that for the last few days have visited so many of the Italian provinces have done very serious damage to property and occasioned much loss of life. The Ligurian seaboard has suffered exceptionally. "Ball lightning" (the *fulmen globulare* of the older meteorologists) has been witnessed several times, the most dangerous and destructive, fortunately the rarest, form which the "thunderbolt" is known to assume. Providentially, however, it has this year numbered no victim in Italy. But the ordinary lightning-stroke has caused much loss of life, to say nothing of many grave lesions more or less permanent. Four fatalities are reported from the recent thunderstorm at Genoa, all instantaneous; and at Ventimiglia in the sacristy of a church where six priests were assembled four were killed outright and the two survivors are in a desperate condition. As a rule lightning-stroke is most common in the open air, generally under the tree to which the victim has resorted for shelter, and this circumstance, even where only severe injury has been sustained, makes death more likely, as the measures for relieving shock and restoring the vital energies cannot be put in practice till too late. But this year the majority of fatalities from lightning have occurred in dwelling-houses. There is no doubt that for this greater frequency of thunderstorms, as for the more prolonged drought and such like meteorological visitations of latter years, the steady tree-felling, unbalanced by tree-planting, is directly responsible. In his memorable plea, "Pro Silvis," the late Professor Cantani, one of Italy's greatest physicians, pointed out the disasters—hygienic, agricultural, and social—to which the kingdom was becoming a prey from the reckless diminution of forest areas on its surface. Re-afforesting the denuded hillsides is, of course, the remedy, but year by year this becomes more impracticable, as the torrential rains, consequent on the disappearance of the woods, wash away the binding soil in which young trees can take root and leave nothing but the bare rock. Those who can recall Monte Gennaro (the Lucretilis of Horace) as it was in the early forties speak of "waving woods" where now the limestone is all too visible, with resulting loss of summer coolness and increase of autumnal rains. Professor Cantani [1] lamented the inadequate provisions for preventing the fatal tree-felling so prevalent all over Italy. True, there are forestal inspectors who patrol the wooded districts and keep an eye on the destruction of timber; but as these officials (like nearly all others in Italy) are miserably underpaid their duty is performed perfunctorily, sometimes not at all. Steps, however, must ere long be taken to remedy this state of things in the peninsula and islands, as the atmospheric disturbances it causes—taking the form of lightning disasters, hail-storms, and protracted drought alternating with excessive rainfall—are pressing more and more heavily on a people terribly overtaxed and becoming yearly less able to withstand the privations and misery which the disastrous weather of the last ten days has already brought in its train.

June 27th.

EGYPT.

(FROM OUR OWN CORRESPONDENT.)

Cholera Bulletins in Egypt.

IN Alexandria the daily cases newly reported still vary from two to four, while in Cairo there are also dropping cases every day in various quarters of the town, the returns having varied during the past week from five to eight. It is only the deaths and the serious cases which are discovered by the medical men; the light cases as a rule go about unknown to themselves and are capable of transmitting indefinitely the disease. Excluding Cairo and Alexandria we have an average of 148 new cases daily in the rest of Egypt from the sea coast up to Assouan. The chief number of towns and villages attacked is in the Delta, notably at Dessouk in the Gharbiyeh province, but no less than 339 cases have been reported during the week from the province of Fayoum in Upper Egypt. This special concentration of the cholera at two places makes one fear that

[1] Vide THE LANCET, Oct. 13th, 1894, pp. 861-2.

the general water-supply of Dessouk and the Fayoum province is perhaps contaminated. Surgeon-Captain Graham is doing all that is possible in the Fayoum province and Rogers Pasha is now inspecting there also. The whole number of cholera cases since October has now reached 5639, and of these 4668 have died.

Presence of Cholera Bacilli in apparently Healthy People.

It was during the Hamburg epidemic that German observers pointed out that a man apparently well and at his usual vocations might yet contain the comma bacilli in his intestines and be a potent means for spreading the disease. Several cases confirmatory of this have been seen in Cairo this month, and there are now two men in one of the cholera hospitals who were sent there on suspicion from different villages because each of them was seen to vomit once by a native medical man searching for cholera. They both looked extremely well and complained bitterly at having been brought to hospital among a lot of dying folk. Both denied all diarrhœa and previous vomiting, but the stools showed unmistakable bacilli and continued in both cases to show them a week after admission to hospital. There are many things yet to be learned about this fell disease.

Cholera in the Army of Occupation.

There have now been four cases, all fatal, among the British troops, and all have had the same history, though, curiously enough, the patients themselves have been most reluctant to give any information. They have been employed at headquarters or on military police duty, and just before their fatal illness each of them is known to have spent some hours drinking in the native bazaars. The troops in barracks, forbidden to visit native grog-shops, and furnished with Pasteurized drinking-water and sterilised soda-water, have so far escaped the disease. In 1883 the epidemic attacked the soldiers in both their hospitals and in the Citadel and Kasr el Nil barracks. Among the Cairo troops there were 179 cases, of which 130 proved fatal. But the mistake made upon that occasion was that instead of fighting the disease on the spot the authorities adopted the old Indian method of running away from it. In nearly every case the troops moved into cholera camps at a distance for the purpose of avoiding cholera and yet succeeded in carrying it with them.

Cairo, June 24th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Semi-centennial Anniversary of the American Medical Association.

THE American Medical Association was organised in the year 1847 and hence its semi-centennial anniversary will occur next year. Its first session was held at Philadelphia, and it is proposed to hold the meeting of next year at that city, with suitable ceremonies. The founder of the Association was Dr. N. S. Davis, now of Chicago, but then a country practitioner in the interior of the State of New York. Dr. Davis is still an active man and has always attended the meetings of the Association and been its guide and faithful counsellor in all its varied history. The Association has a larger influence upon the profession than any and all other medical organisations in this country. It combines the scientific and social elements in such manner as to attract all classes and render its annual meetings extremely popular. Perhaps its most important work has been in connexion with medical education. This subject has always been foremost in its discussions, and by a paternal influence with the schools it has in many ways raised the standard of respectability of the profession over the entire country. It is to be hoped that this anniversary will be an era in its history.

Title of Army Medical Officers.

The Surgeon-General of the United States Army thus defines the customary title of Army Medical Officers. "Medical officers of the army are commissioned as assistant surgeons with the rank of first lieutenant, assistant surgeons with the rank of captain, surgeons with the rank of major, deputy surgeons-general with the rank of lieutenant-colonel, and assistant surgeons-general with the rank of colonel. In all official communications they are addressed according to these designations. It is customary in social intercourse to address medical officers by their professional title, and in my judgment there is no objection to this form of address. Some of our medical officers, however, insist upon being called by their military titles. This is in accordance with the usage in other staff corps. There seems to be no question as to the propriety of addressing a paymaster or a commissary or an adjutant-general by his military title; but in the case of a medical officer, upon whom the degree of doctor of medicine has been duly conferred, it would appear that in social and professional intercourse this title should have the preference."

The Marine Hospital Service.

The Marine Hospital Service is among the oldest branches of the public service. It was created in 1797 in imitation of the British marine service for the benefit of the sick sailors of the merchant marine. Its organisation is very perfect and it attracts the most promising of the recent medical graduates. Candidates are required to be not less than twenty-one years of age, and no appointment is made of any candidate over thirty years of age. They must be graduates of a reputable medical college and furnish testimonials as to character. Successful candidates having made the required grade are appointed in order of merit as vacancies arise during the succeeding year. There is at present one vacancy. A successful candidate, when recommended for appointment, is commissioned by the President of the United States as an assistant surgeon. After four years of service and a second examination he is entitled to promotion to the grade of passed assistant surgeon; and to the rank of surgeon, according to priority, on the occurrence of vacancies in that grade. The salary of an assistant surgeon is $1600 per annum, together with furnished quarters, light, and fuel; that of a passed assistant surgeon, $1800 per annum; and that of a surgeon, $2500 per annum. In addition to the above salaries, after five years of service an additional compensation of 10 per cent. of the annual salary for each five years of service is allowed medical officers above the rank of assistant surgeons, the maximum rate, however, not to exceed 40 per cent. When an officer is on duty at a station where there are no quarters furnished by the Government commutation of quarters is allowed at the rate of $30 per month for an assistant surgeon, $40 for a passed assistant surgeon, and $50 for a surgeon. The successful candidates, after receiving appointments, are usually ordered to one of the larger stations for training in their duties.

Relations of Medical Examining Boards.

Most of the States now have medical examining boards before which all persons proposing to practise medicine must appear and submit their qualifications under the law and obtain licences. In general such applicants are examined as to their educational qualifications, and it now appears that in the different States there are different standards, and the question has arisen, Shall the licence granted in one State be received in all the other States as *primâ facie* evidence that its possessor is a qualified physician? At a recent meeting of the National Confederation of State Medical Examining Boards it was proposed that all of the States should establish a common minimum level of requirements below which a physician should not be permitted to practise. Then a State licence would possess equal value in all of the States. Until all standards are equalised and the lowest brought up to the level of the highest, inter-State courtesy by official endorsement of licences should not be required or expected.

Prevention of Contagious Diseases on Railways.

The Medico-Legal Society of New York is agitating the question of requiring railway companies to make stringent regulations in regard to the transportation of contagious diseases. It regards the sleeping car as the point of greatest danger, and urges that compartments which have been occupied by a consumptive, or person sick of any contagious disease, shall not be occupied until it has been thoroughly disinfected. As preventive measures the society recommends (1) education of the public through the daily press; (2) legislation, state and national; (3) isolation of passengers; and (4) disinfection of berths and compartments.

Exposure of Food to Dust.

The progress of sanitary administration in this country is well illustrated by the following circular of the health officer of the State of Indiana to the county health officers of the State: "In many cities and towns it is the custom of grocers, butchers, and other vendors of food to expose their goods in front of their shops and stores. Butchers very frequently

make an unusual exposure of meats to the dust and filth of the street. Grocers expose on the side-walks in front of their stores dried fruits, smoked meats, &c. Objections: The dust that floats in the air contains a great deal of filth. It is pulverised manure, dried catarrhal and consumptive sputum, and much other offensive matter, besides micro-organisms of all kinds. All this we must endure to the evident disadvantage of our health when we walk abroad in cities where dust is not kept down. It is not well, however, that we should eat dried manure and dried spittle in our meat and groceries, even if cooked. What to do: county health officers are hereby directed to issue written orders to all butchers and vendors of meat not to expose outside their shops carcasses or parts of carcasses of any animal intended for food Neither shall dressed meats be transported through the streets without being protected from the dust. Grocers must be ordered not to expose dressed poultry, nor uncovered smoked meats, nor any foods which may become polluted by dust."

June 18th, 1896.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ELECTION OF MEMBERS OF COUNCIL.

THE eighth election of Fellows to fill the vacancies in the Council of the College under the new regulations was held in the library of the Royal College of Surgeons, Lincoln's-Inn-Fields, on Thursday, the 2nd inst., between 2 P.M. and 4 P.M. The result of the voting was as follows:—

	Votes.	Plumpers.
MR. T. BRYANT	291	4
MR. J. N. C. DAVIES-COLLEY ...	254	40
MR. T. PICKERING PICK	238	3
MR. GEORGE D. POLLOCK	206	13
MR. EDMUND OWEN...	182	15
MR. R. CLEMENT LUCAS	173	6
MR. W. J. WALSHAM	128	13
SIR WILLIAM B. DALBY	88	7

Mr. Bryant and Mr. Pick were declared to be re-elected members and Mr. Davies-Colley was elected a member. There were 571 voting papers received and 48 Fellows voted personally.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—The following is a list of the Examiners of the Society of Apothecaries of London for 1896–97, showing the subjects in which they examine and the London medical schools to which they are respectively attached as teachers. The examiners in Medicine are all Fellows of the Royal College of Physicians of London and the examiners in Surgery are all Fellows of the Royal College of Surgeons of England. Those marked with an asterisk are members of the Court of Examiners.

Medicine.—*Sir H. R. Beevor, M.D. Lond., F.R.C.P. Lond., Kings' College; *C. Y. Biss, M.D. Cantab., F.R.C.P. Lond., Middlesex Hospital; *F. de Havilland Hall, M.D. Lond., F.R.C.P. Lond., L.S.A., Westminster Hospital; *A. P. Luff, M.D. Lond., F.R.C.P. Lond., St. Mary's Hospital; G. Newton Pitt, M.D. Cantab., F.R.C.P. Lond., Guy's Hospital; *H. D. Rolleston, M.D. Cantab., F.R.C.P. Lond., St. George's Hospital; and *Francis Warner, M.D. Lond., F.R.C.P. Lond., L.S.A., London Hospital.

Surgery.—Appointed by the Medical Council: *W. Adams Frost, F.R.C.S. Eng., St. George's Hospital; *Arthur T. Norton, F.R.C.S. Eng., St. Mary's Hospital; *Bernard Pitts, F.R.C.S. Eng., St. Thomas's Hospital; *Bilton Pollard, F.R.C.S. Eng., University College; and *C. B. Lockwood, F.R.C.S. Eng., St. Bartholomew's Hospital. Appointed by the Society: L. A. Dunn, F.R.C.S. Eng., Guy's Hospital.

Midwifery.—Wm. John Gow, M.D. Lond., St. Mary's Hospital; and *Arthur H. N. Lewers, M.D. Lond., L.S.A., London Hospital.

Anatomy.—F. G. Parsons, F.R.C.S. Eng., St. Thomas's Hospital; and J. W. S. Boyd, M.B. Lond., F.R.C.S. Eng., Charing-cross Hospital.

Physiology and Biology.—P. T. Beale, F.R.C.S. Eng., King's College; and H. W. M. Tims, M.D., M.S. Edin., Westminster Hospital.

Chemistry.—H. Forster Morley, M.A., D.Sc. Lond., Charing-cross Hospital; and F. J. M. Page, B.Sc. Lond., London Hospital.

Materia Medica and Pharmacy.—H. Sainsbury, M.D. Lond., F.R.C.P. Lond., Royal Free Hospital; and J. Galloway, M.D. Aberd., London Hospital.

FOREIGN UNIVERSITY INTELLIGENCE.—*Ghent:* The Belgian Government proposes to increase the staff of professors by three, so that provision may be made for teaching special subjects in a more efficient manner than is at present possible.—*Heidelberg:* Dr. Vulpius has been recognised as *privat-docent* in orthopædic surgery.—*Liége:* It is proposed to increase the number of professors from ten to thirteen.

DR. J. C. THRESH, the medical officer for the County of Essex, has received the degree of Doctor of Medicine of Victoria University. The subject of the dissertation presented by Dr. Thresh was "Water and Water-supplies"; and the Council of the University have regarded it as of such merit that Dr. Thresh also receives a gold medal, the only one awarded.

GREAT NORTHERN CENTRAL HOSPITAL.—A concert at Queen's Hall on June 11th, in aid of the Ladies' Association Endowment Fund, Great Northern Central Hospital, yielded over £1100, to which have to be added the purses presented to H.R.H. the Duchess of York at the Hall, making a further sum of £1800, or about £2900 in all. Two beds have been endowed at the hospital, one of them being named after Prince Edward of York.

FREEMASONRY: THE RAHERE LODGE, No. 2546.—The installation meeting of this lodge was held in the Great Hall of St. Bartholomew's Hospital on June 9th when 110 members and visitors were present. Brother Alfred Cooper, P.G.D., was installed as the second W.M. by Brother Clement Godson, P.G.D. The following officers were appointed: Brothers Clement Godson, I.P.M.; W. J. Walsham, S.W.; T. G. A. Burns, J.W.; Rev. Sir B. Savory, Chaplain; R. J. Reece, Treasurer; D'Arcy Power, Secretary; W. Gripper, S.D.; Phineas S. Abraham, S.D.; G. H. R Holden, I.G.; F. Swinford Edwards, D.C.; J. H. Gilbertson, C. B. Lockwood, and C. P. White, Stewards; Ernest Clarke, Organist; and P. F. Madden, Tyler. In the course of the evening Messrs. Balfour Neill, M.D., H. W. Lance, E. W. Willett, M.B., H. W. Newton, M.R.C.S., and W. H. Cross were admitted into Freemasonry. A Past Master's jewel was presented to Brother Godson in token of his services to the lodge during the past year. The brethren subsequently adjourned to a banquet at the Frascati Restaurant, Oxford-street.

DIPHTHERIA IN LONDON.—The data for the four weeks ended June 13th do not afford any indication of a decline in the amount of diphtheria in London. The figures are higher than those for any like period since that which brought 1895 to a close. The total of notified cases in the period under review was 1060, yielding a weekly average of 265 cases, as compared with 222 in the preceding period, ended May 16th. Every sanitary area in the metropolis was invaded, and four districts had an aggregate of 337 notified cases—namely, Islington, 107; Camberwell, 106; Greenwich, 73; and Poplar 51 notifications. In the preceding period the four highest figures totalled only to 283, but they were those of the identical areas now in question showing the foothold that the disease has in those localities. The deaths registered in the June period totalled to 196, against 161, and were, on the average, 49 weekly, as compared with 40 in the preceding period. The per case mortality was 18·5 per cent., as compared with 18·1 per cent. Thus we see the disease once again manifesting a disposition to become increasingly epidemic, both in its amount and its character. In the several four-weekly periods of the present year, down to and including June 13th, the notified cases have been 988, 1054, 1009, 785, 890, and 1060. In the two weeks ended last Saturday the deaths in London have been respectively 40 and 37. The latter number was only 5 in excess of the corrected decennial average for the twenty-sixth week of the year, though, of course, as the deaths are continuously high week by week for long terms the average continues to increase, so that it is no longer the guide it would be did the excess only occur infrequently. The 37 deaths of last week were all of persons aged under twenty years. Camberwell is credited with 7 of the deaths, Islington with 6, and Hackney with 5. The admissions to hospital were 112, as compared with 132, 109, and 91 in the three preceding weeks, and there remained under treatment last Saturday 749 patients suffering from the disease, a number exceeded in the present year only on the two preceding Saturdays.

LITERARY INTELLIGENCE.—We understand that the next instalment of the "System of Medicine," which Professor Clifford Allbutt is editing for Messrs. Macmillan and Co., will deal with Gynæcology and will appear in the course of September. Dr. Playfair is associated with Professor Allbutt as editor of this volume, which, though uniform with the system, will be complete in itself. The second volume of the "System of Medicine" proper may be expected by the end of the year. Messrs. Macmillan and Co. will also shortly issue a work on "Deformities," by Mr. A. H. Tubby. It is a comprehensive treatise on orthopædic surgery and is fully illustrated by 200 original plates and figures and notes of 100 cases.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Benno Schmidt, Honorary Professor of Surgery in the University of Leipzig.—Dr. Gerhard Rohlfs, the well-known African traveller. He studied Medicine in Würzburg, Heidelberg, and Gottingen, and entered the French military medical service in Algiers. He wrote a good deal on Medical Geography, and in 1878, together with his brother Heinrich Rohlfs, commenced to publish the *Deutsche Archiv für Geschichte der Medicin und Medicinische Geographie*, which, however, did not last very long. He died in Godesberg aged sixty-five years.

SOCIETY OF FELLOWS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The annual meeting of this society was held at 146, Harley-street, on July 1st. The minutes of the last annual meeting having been read and confirmed, the chairman of the Executive Council (Mr. Herbert Page) gave an account of the work of the society during the past year. Referring to the resolution which was carried at the January meeting of the Fellows of the College on the desirability of giving to Members direct representation upon the Council, he said that inasmuch as the Council had resolved to take a poll of the Fellows on the point it was unnecessary for the society at this juncture to move further in the matter. Having regard to the original intentions in founding the society—viz., to ascertain by conference or otherwise the opinion of the general body of Fellows on questions of importance affecting the interests of the College—there seemed at present no other subjects of such urgency as to call for immediate action on the part of the society. On the motion of Mr. Davies-Colley, seconded by Mr. Frederick Durham, it was agreed that the members of the Executive Council should continue to hold office during the coming year, and the names of two additional members were suggested. On the motion of Mr. Eastes a unanimous vote of thanks to the chairman was passed, and the meeting adjourned.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Diseases of Animals Bill.

THE Bill to make statutory and permanent the present restrictions of the Board of Agriculture on the importation of live cattle from abroad has got through all its stages in the House of Commons and goes to the House of Lords in exactly the same form in which it was introduced.

Edinburgh University Chairs.

The arrangements for the transfer of the right of patronage to the chair of Natural History in the University of Edinburgh now exercised by the Crown to the curators of patronage in the University and the transfer of the right of patronage to the chair of Botany now vested in the curators to the Crown have been incorporated in a Bill, and the Bill has been introduced into the House of Lords by the Government.

Petroleum Lamp Accidents.

The Select Committee on Petroleum and Petroleum Lamp Accidents examined on Wednesday, June 24th, Sir Henry Roscoe, and received from him interesting evidence as to experiments made by him with different kinds of lamps and oil. These experiments showed that the maximum temperature of the oil in the fount after four hours' burning in the case of low flash-point oils always exceeded the temperature of the flash point, while in the case of high flash point the oil in the fount never reached the temperature of the flash point, but left what Sir Henry Roscoe described as a margin of safety. The low-flash oils he used in the experiments were 73 and 83 degrees respectively, while the high-flash oil was from 102 to 103 degrees, and the conclusion at which Sir Henry Roscoe has arrived is that the statutory flash point should be raised from 73 degrees to 100 or 105 degrees.

Teaching University for London.

The Government has made it known that a Bill on this subject will be introduced in the House of Lords.

Floods Prevention Bill.

Provisions have been inserted in this Bill in the House of Lords securing that the rights of existing water companies and river authorities shall not be interfered with without their assent.

HOUSE OF COMMONS.

TUESDAY, JUNE 23RD.

Poor Relief (Ireland) Bill.

The Chief Secretary for Ireland intimated, in reply to a question, that it is proposed by the Government to appoint a small Commission or Committee in connexion with this Bill to inquire how unions in Ireland could be most conveniently grouped together for purposes of amalgamation.

THURSDAY, JUNE 25TH.

Army Medical Department.

Captain Norton asked the Under-Secretary of State for War whether he would consider the advisability of reducing the period for which the Director-General Army Medical Staff was appointed from seven to five years, this latter being the period for which all other staff appointments in the army were held?—Mr. Brodrick replied that the Royal Commission of 1858 on the Sanitary Condition of the Army, over which Lord Herbert presided, recommended that the appointment of Director-General should be for a longer period than five years, and Lord Herbert himself when Secretary of State fixed the period at seven years, which had since been maintained. Nothing had occurred to induce the Secretary of State to think that any alteration in the period of tenure was necessary or desirable.

Poor-law Schools.

Mr. T. W. Russell, Parliamentary Secretary to the Local Government Board, said, in reply to a question by Mr. Mundella, that the Board are quite willing to concur in the proposal that the inspection of education in Poor-law schools should be undertaken by the Education Department, and the President of the Local Government Board is in communication with the department on the subject.

FRIDAY, JUNE 26TH.

Protection of Life at Sea.

Mr. Ritchie, President of the Board of Trade, assured the House, in answering a question, that every care was taken to secure that the life-belts and other life-saving appliances required to be carried by British ships were not only provided, but that they were in good condition and readily available. The statutory rules made under the Act required that "all life-buoys and life-belts shall be so placed as to be readily accessible to all persons on board and so that their position may be known to those for whom they are intended." The Board of Trade inspectors were in constant communication with the department and the necessity for vigilance in this important matter was impressed upon them in every possible way.

Cocoa and Cocoa Butter.

Sir H. Vincent asked the Chancellor of the Exchequer if, having regard to the fact that inquiries instituted by the Secretary to the Treasury had proved that considerable quantities of a dutiable article—namely, cocoa—were being imported from Germany and Holland duty free disguised as cocoa butter, and that the revenue was thereby prejudiced as well as British trade and labour, he would introduce such amendment as might be necessary in the Finance Bill so as to put Britisher and foreigner on the same footing. The Chancellor of the Exchequer replied that this matter affected very few persons and a very small amount of revenue, but he thougnt such an amendment as was suggested should be made if it could be done without expending an amount of time disproportionate to its importance.

MONDAY, JUNE 29TH.

Old Age Pensions.

Mr. Balfour at this sitting announced that the reference to the Royal Commission on Old Age Pensions will be in the following terms, viz.:—"To consider any scheme that might be submitted to them for encouraging the industrial population, by State aid or otherwise, to make provision for old age; to report whether they could recommend any proposals of the kind, either based upon or independent of such schemes, and with special regard to any proposals of which they might approve the cost and probable financial results to the exchequer and to the local rates; their effects in promoting habits of thrift and self-reliance; their influence on the prosperity of friendly societies, and the possibility of securing the cooperation of these institutions in their practical working." Mr. Balfour was unable to give the names of the commissioners, but he assured the House that care would be taken that some members were thoroughly cognisant with the views and wishes of the friendly societies.

BOOKS, ETC., RECEIVED.

ARNOLD, E., Bedford-street, London.

An Eton Playing-Field: a Reminiscence of Happy Days spent at the Eton Mission. By E. M. S. Pilkinton.

AUTHORS' AND PRINTERS' JOINT INTEREST PUBLISHING COMPANY, Arundel-street, Strand, London.

Voxometric Revelation: The Discovery of the Human Voice. Written and compiled by Justus Abner for the Author, Alfred A. North. 1896.

BAILLIÈRE, TINDALL, AND COX, King William-street, Strand, London.

The Modern Treatment of Stone in the Bladder by Litholapaxy. By P. J. Freyer, M.A., M.D., M.Ch. Second Edition. 1896. Price 5s.

BLACK, ADAM AND CHARLES, Soho-square, London, W.

Rheumatism: Its Nature, its Pathology, and its Successful Treatment. By T. J. Maclagan, M.D. Second Edition. 1896. Price 10s. 6d.

BLACKWOOD, W., AND SONS, London and Edinburgh.
Fellow Travellers. By Graham Travers. 1896. Price 6s.

BRAUMÜLLER, W., Wien und Leipzig.
Braumüller's Bade-Bibliothek. Baden-Baden und seine Thermen. Von Dr. W. H. Gilbert, Baden-Baden. Zweite verbesserte Auflage. 1896.

FISCHER, GUSTAV, Jena.
Handbuch der Anatomie. Von Professor Dr. Karl von Bardeleben. 1. Band, 1. Lieferung. 7. Band, 2. Lieferung. 1895.
Handbuch der Speciellen Therapie Innerer Krankheiten. Von Dr. F. Penzoldt und Dr. R. Stintzing. Lieferung 26. 1896.

MACMILLAN AND CO., London.
Micro-organisms and Disease. By E. Klein, M.D., F.R.S. New Edition. Illustrated. 1896. Price 10s. 6d.

SMITH, ELDER, AND CO., Waterloo-place, London.
Dictionary of National Biography. Edited by Sidney Lee. Vol. 47. Puckle—Reidfurd. 1896.

SOCIÉTÉ D'ÉDITIONS SCIENTIFIQUES, Paris.
Les Toxines Microbiennes et Animales. Par A. Gautier. 1896. Prix 15 francs.
Éléments d'Ophtalmologie Journalière. Par Drs. A. Puech et E. Fromaget.

THE REBMAN PUBLISHING COMPANY, Adam-street, Strand, London.
Transactions of the British Laryngological and Otological Association. Seventh annual summer meeting, 1895.

UNWIN, T. F., Paternoster-square, London, E.C.
The Crowd: a Study of the Popular Mind. By Gustave le Bon.

VOSS, LEOPOLD, Hamburg und Leipzig.
Jahrbücher der Hamburgischen Staatskrankenanstalten. Von Dr. T. Rumpf. Band 4. Jahrgang 1893-1894. 1896.

WILLIAMS AND NORGATE, Henrietta-street, Covent-garden, London
Lehrbuch der Kinderkrankheiten, für Aerzte und Studirende. Von Dr. A. Baginsky. 1896.

Précis Élémentaire de Dermatologie: Maladies en Particulier (4) et Formulaires; par L. Brocq et L. Jacquet (Masson et Cie, Paris).—L'Ergotisme: Ignis Sacer, Ignis Sancti Antonii; par le Dr. E. Ehlers (Masson et Cie., Paris).—Maladies des Voies Urinaires: Semeiologie; par P. Bazy (Masson et Cie., Paris).—Traité d'Électro-thérapie Oculaire; par le Dr. P. Pousier (d'Avignon); avec une preface de M. le Dr. E. Valude (A. Maloine, Paris, 1895).—Thirty-fifth Annual Report of the Cincinnati Hospital to the Mayor of Cincinnati for the Fiscal Year ending Dec. 31st, 1895; by F. W. Hendley, M.D., Superintendent (The Commercial Gazette Job Print, Cincinnati, 1896).—Abstract of the Transactions of the Hunterian Society, 1895-6: Seventy-seventh Session (Headley Brothers, Bishopsgate-street-without, London, E.C., 1896).—The New Treatment of Gout by Pitkeathly cum Lithia; written by an M.D. (Reid and Donald, Chemists, George-street, Perth, 1896); price 1s.—Clinical Reports on Certain Typical Cases treated with Fletcher's Hydrobromates (Fletcher, Fletcher, and Co., Holloway, London).—Clinical Reports upon an entirely New Method of Exhibiting Cinchona or its Alkaloids (Fletcher, Fletcher, and Co., Holloway, London).—Transactions of the Chicago Pathological Society, from October, 1894, to November, 1896; vol. i. (American Medical Association Press, Chicago, 1896).—Metropolitan Asylums Board: Reports for the Year 1895 (McCorquodale and Co., Cardington-street, London, N.W.); price 5s.—Handatlas der Anatomie des Menschen; von W. Spalteholz; 1. Band, 2. Abtheilung (S. Hirzel, Leipzig, 1896).—Annales de la Société Royale des Sciences Médicales et Naturelles de Bruxelles; tome 5, fasc. 3 (Henri Lamertin, Bruxelles, 1896).—Bulletin de la Séance de Juin, 1896; 54e année; No. 6 (H. Lamertin, Bruxelles, 1896).—Transactions of the American Orthopædic Association: Ninth Session; vol. viii. (Published by the Association, Philadelphia, 1896).—Magazines, &c., for July: Strand Magazine, Boys' Own Paper, Girls' Own Paper, Leisure Hour, Sunday at Home, Ludgate Magazine, Westminster Review, Contemporary Review, Friendly Greetings, Architecture, Chapman's Magazine, Myra's Journal, Cornhill Magazine, Knowledge, Summer Number of Boys' Own Paper and Girls' Own Paper, Pall Mall Magazine, Windsor Magazine, Leeds Hospital Magazine.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week for publication in the next number.*

ANDERSON, C. W., M.B., C.M. Edin., has been appointed Parochial Medical Officer by the Kincardine (Ross) Parish Council.

ANGELL, ARTHUR, has been appointed Public Analyst by the Hants County Council.

BARFORD, P. C., L.R.C.P. Lond., M.R.C.S., has been appointed Clinical Assistant to the Central London Throat and Ear Hospital.

BUCKELL, A. E., M.D. Lond., M.R.C.S., has been appointed Honorary Medical Officer to the Chichester Infirmary, vice F. V. Paxton, resigned.

BURNS, R. J., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Bishopwearmouth East Sanitary District of the Sunderland Union.

CASTLE, R. F., M.B., B.C. Camb., M.R.C.S., has been appointed Medical Officer by the Darfield Urban Council.

CHATTAWAY, WM., has been appointed Public Analyst by the Hammersmith Vestry.

COLWELL, J. K., has been appointed Public Analyst by the Holborn District Board of Works.

CORSER, F. R. S., M.B., C.M. Edin., has been re-appointed Medical Officer of Health for the Second Division of the Stow-on-the-Wold Rural Sanitary District.

COYLE, B. J., L.R.C.P., L.R.C.S. Irel., has been appointed Medical Officer of Health for the Inistioge Dispensary District, county Kilkenny.

CROSS, G. F., M.B., B.S. Durh., has been appointed Medical Officer of Health for the Downham Rural Sanitary District, vice F. W. Kirkman, resigned.

DAVIES, J. E. P., M.B., B.Sc. Lond., L.R.C.P., M.R.C.S., has been appointed House Physician to St. Mary's Hospital, Paddington.

DENING, E., L.R.C.P. Edin., M.R.C.S., has been re-appointed Medical Officer of Health for the Stow-on-the Wold Urban Sanitary District.

DRUITT, A. E., L.R.C.P., M.R.C.S., has been appointed House Physician to the Royal Hospital for Diseases of the Chest, City-road, London.

FRY, W. W. B., M.B., C.M. Edin., has been appointed Medical Officer of Health by the Builth and Colwyn Rural District Councils.

GRIFFITHS, W. H., M.R.C.S., has been appointed Medical Officer of Health by the Hinckley Urban District Council.

HANDFIELD-JONES, M., M.D. Lond., M.R.C.P., M.R.C.S., has been appointed Examiner in Midwifery for the Third Examination of the Royal College of Surgeons of England.

HIGHET, CAMPBELL, M.B. and C.M. Glasg., has been appointed Assistant Medical Officer to the Govan District Asylum at Hawkhead, near Paisley.

HOLMES, E. R., M.B., C.M. Edin., has been appointed House Surgeon to Noble's Hospital, Isle of Man.

JOHNSON, M. B., L.R.C.P., M.R.C.S., has been appointed Senior House-Surgeon to the Lock Hospital, Harrow-road, Paddington.

LOW, V. W., M.D. Lond., F.R.C.S., has been appointed Resident Medical Superintendent to the Hospital for Sick Children, Great Ormond-street, Bloomsbury.

LUFF, A. P., M.D. Lond., F.R.C.P., M.R.C.S., has been appointed Examiner for the Diploma in Public Health, Royal College of Surgeons of England.

MAIR, JAMES, M.B., C.M. Glasg., has been appointed Resident Medical Officer for the Poorhouses by the Dundee Parish Council.

MOORE, E. H., has been appointed Public Analyst by the East Sussex County Council.

MURRAY, JOHN, F.R.C.S., has been appointed Assistant Surgeon to the Middlesex Hospital.

PARKER, R. D., L.R.C.P., M.R.C.S., has been appointed House Surgeon to the Bridgwater Infirmary.

PATON, E. P., M.D. Lond., L.R.C.P., F.R.C.S., has been appointed Surgical Registrar to the Westminster Hospital, vice P. de Santi.

POWELL, J. C., L.R.C.P., M.R.C.S., has been appointed Assistant Medical Officer to the Brooke House Asylum, Upper Clapton.

POYNTON, F. J., M.B. Lond., L.R.C.P., M.R.C.S., has been appointed House Surgeon to the Hospital for Sick Children, Great Ormond-street, Bloomsbury.

PRIOR, C. E., M.D. Aberd., F.R.C.S., Eng., has been re-appointed Medical Officer of Health for Biggleswade.

ROBB, ALEXANDER, M.B., M.S. Aberd., has been appointed Assistant Medical Officer of Health for the county of Lanark.

ROGERS-TILLSTONE, J. M., M.R.C.S., L.R.C.P., has been appointed Medical Officer and Public Vaccinator for the Second District of the Malling Union, vice H. E. Taylor, resigned.

SMYTH, E. J., M.B. Lond., L.R.C.P., M.R.C.S., has been appointed Assistant Medical Officer for the Infirmary of the Wandsworth and Clapham Union.

TAYLOR, R., M.R.C.S., has been appointed Medical Officer for the Gray's-inn-road Workhouse, parish of St. Marylebone.

THOMPSON, J. H., L.K.Q.C.P. Irel., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for Mytholmroyd.

WATERS, F. W., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Berrlew Sanitary District of the Forden Union.

WILLS, CHARLES, M.R.C.S., has been re-appointed Medical Officer of Health for Southwell.

WILSON, A. C. J., L.R.C.P. Edin., M.R.C.S., has been re-appointed Medical Officer by the Thurlston Urban District Council.

YOUNG, MEREDITH, M.B., C.M. Edin., has been re-appointed Medical Officer by the Brighouse Town Council.

ERRATUM.—In the "Appointments" column in our last week's issue the name "Cargyll" should read *Cargill*.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

CENTRAL LONDON OPHTHALMIC HOSPITAL, 238, Gray's-Inn-road, W.C.—House Surgeon.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL AND DISPENSARY, Chesterfield.—Resident Junior House Surgeon and Dispenser. Salary £50 per annum, with board, apartments, and laundress.

CHILDREN'S HOSPITAL, Nottingham.—House Surgeon (non-resident) for six months. Salary at the rate of £100 per annum.

COUNTY BOROUGH OF HUDDERSFIELD.—Medical Officer of Health for the Borough and Urban Sanitary District of Huddersfield. Salary £400 per annum, with actual disbursements. Applications to the Town Clerk, Town Hall, Huddersfield.

GENERAL INFIRMARY AT GLOUCESTER AND THE GLOUCESTER EYE INSTITUTION.—Assistant House Surgeon, for six months. Board residence, and washing provided.

GLASGOW SAMARITAN HOSPITAL FOR WOMEN, Victoria-road, Glasgow.—Resident (lady) Clinical Assistant.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway-road, N.—House Surgeon, for six months. Salary £60 per annum, with board, lodging, and laundry provided in the hospital. Also Junior House Surgeon, for six months. Board, lodging, and laundry provided in the hospital.

ISLE OF WIGHT COUNTY ASYLUM.—Assistant Medical Officer. Salary £100 per annum, with board and lodging, &c., but without alcohol. Applications to the Medical Superintendent, Whitecroft, near Newport, Isle of Wight.

JOINT COUNTIES ASYLUM, Abergavenny.—Junior Assistant Medical Officer. Salary £100 per annum, increasing by two yearly instalments of £25 to £150, with board, lodging, and washing.

OWENS COLLEGE, Manchester.—Senior and Junior Demonstrator in Physiology. Stipends £150, rising to £200, and £100, rising to £150 respectively.

PARISH OF ST. PANCRAS, London.—Dispenser at the North Dispensary of the parish, at Bower Cottage, Leighton-road, Kentish Town. Salary £100 per annum, rising by annual increments of £5 to £130 per annum. Applications to the Clerk, Vestry Hall, St. Pancras, N.W.

TAUNTON AND SOMERSET HOSPITAL, Taunton.—House Surgeon for three years. Salary £100 per annum, with board, lodging, and washing in the hospital.

UNIVERSITY OF ABERDEEN.—University Assistant in Physiology. Salary £150, rising by annual increments of £25 to £200. Applications to Professor MacWilliam.

WARNEFORD HOSPITAL, Leamington.—House Surgeon for six months. Salary £100 per annum, with board, lodging, and washing.

WEST RIDING ASYLUM, Menston, near Leeds.—Fourth Assistant Medical Officer. Salary to commence at £100, rising £10 annually to £150, with board and apartments.

WILTS COUNTY ASYLUM.—Assistant Medical Officer, unmarried. Salary £130, rising £10 a year, if approved, to £160, with board (no beer or wine), residence, attendance, and washing.

Births, Marriages, and Deaths.

BIRTHS.

DAWES.—On June 30th, at St. Helier, Longton, Staffs., the wife of J. W. Dawes, M.B., C.M. Edin., of a son.

MACDONNELL.—On June 22nd, at Harley-street, Cavendish-square, W., the wife of Mark A. MacDonnell, M.D., M.P., of a daughter, still-born.

PANTIN.—On June 29th, at Finch-road, Douglas, Isle of Man, the wife of C. S. Pantin, M.D., F.R.C.S., of a daughter.

PAYNE.—On June 24th, at Chichele-road, Cricklewood, N.W., the wife of Ed. Marten Payne, M.B., C.M., of a daughter.

ROBERTS.—On June 28th, at Cliveden-place, Eaton-square, S.W., the wife of Edward A. Roberts, M.D., of a son.

WICKHAM.—On June 25th, at Elmlea, Willesborough, Kent, the wife of Charles A. Wickham, L.R.C.P., of a son.

MARRIAGES.

COYSH—WESTON.—On June 24th, at St. Agnes Church, Ullet-road, Liverpool, Thomas Arthur Coysh, L.D.S., of Chiswick High-road, Gunnersbury, W., to Maude, only child of W. L. Weston, of Liverpool.

CURTIS—HOLROYD.—On June 23rd, at Templemichael, county Waterford, James Henry Curtis, Surgeon-Captain A.M.S., only son of James Good Curtis, Esq., F.R.C.S.I., Cork, to Gertrude Beryl, eldest daughter of the late George Frederick Holroyd, Esq.

FRENCH—MACLEAY.—On June 23rd, at St. James's Church, Dingwall, Ross-shire, Robert Houle French, M.B., M.R.C.S., L.R.C.P., of Mossbank, North Finchley, N., to Dolina (Dolly), fourth daughter of Hay Mackenzie Macleay, Esq., of Dingwall.

GIBSON—BRIGGS.—On June 16th, at St. Michael's Church, Melbourne, by the Rev. Canon Singleton and the Venerable Archdeacon Scott, Edmund Valentine Gibson, M.D. Edin., of 16, Hauteville, Guernsey, youngest son of the late Rev. A. A. Gibson, Vicar of Stanley, to Florence Mary, eldest surviving daughter of William Briggs, Esq., J.P., C.C., of Bleak House, Melbourne, Derbyshire.

GODFREY—FLETCHER.—On June 30th, at St. Olave's, York, by Rev. W. Dodsworth, Dr. H. J. Clarendon Godfrey, of Bridlington Quay, to Edith Margaret, eldest daughter of the late Allen Fletcher, of Bootham, York.

SALTER—TAYLOR.—On June 23rd, at St. Martin's Church, Scarborough, Charles Edward Salter, M.D., F.R.C.S., second son of H. J. Salter, of Elmwood, Putney, to Annie Gertrude, second daughter of the late Dr. John W. Taylor, of Rothsay House, Scarborough.

SLOGGETT—MOORE.—On June 24th, at St. Mary's, Bathwick, Bath, William Henry Sloggett, of Tremabyn, Paignton, S. Devon, Inspector-General of Hospitals and Fleets, to Constance Fanny Tunnard Moore, second daughter of Colonel Charles Moore, C.B., F.S.A., of Frampton Hall, Lincolnshire.

WILLIAMS—LEE.—On July 1st, at the Hornsey Parish Church, George Rowland Williams, M.R.C.S., L.R.C.P. Lond., second son of the late Benjamin Williams of Glinton, to Ella Mary, eldest daughter of the late Alfred R. Lee, M.R.C.S., L.R.C.P. Edin., of Queen street, Cheapside, E.C.

DEATHS.

BARRATT.—On June 23rd, at Netley Abbey, Hants, Joseph Gillman Barratt, M.D., F.R.C.S., M.R.C.P., aged 77.

BEALE.—On June 14th, at Swansea, Thomas Miles Beale, surgeon, late of Shepherd's-bush, aged 63.

RALFE.—On June 26th, at Billericay, Charles Henry Ralfe, M.A., M.D. Cantab., Consulting Physician to the London Hospital, and late of Queen Anne-street.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 2nd, 1896.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Dry Bulb.	Wet Bulb.	Solar Radia in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Rainfall.	Remarks at 8.30 A.M.
June 26	30·17	N.E.	67	52	122	70	52	...	Cloudy
,, 27	30 13	N.W.	61	57	108	78	53	...	Hazy
,, 28	30 09	N.W.	71	65	119	78	61	...	Cloudy
,, 29	30·21	N.W.	62	55	116	71	54	0·10	Cloudy
,, 30	30 01	W.	64	59	120	75	55	...	Cloudy
July 1	29·91	N.W.	60	55	100	65	57	...	Overcast
,, 2	29 98	N.W.	55	53	87	61	52	0·03	Overcast

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (6th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M., Ophthalmic 1.15 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), St. Mark's (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.).

TUESDAY (7th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (2 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.).

WEDNESDAY (8th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.).

THURSDAY (9th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.)

FRIDAY (10th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.).

SATURDAY (11th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing cross (3 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M), Cancer (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

THURSDAY (9th).—BRITISH GYNÆCOLOGICAL SOCIETY (20, Hanover-square, W.)—8.30 P.M. Specimens will be shown by Dr. A. Smith (Dublin) and Dr. Elder (Nottingham). Specimens and Notes of Cases by Dr. Macnaughton Jones. Paper:—Dr. Edge (Wolverhampton): Cases of Vaginal Cœliotomy.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (6th).—EAST INDIA ASSOCIATION (Westminster Town Hall).—3 P.M. Dr. K. N. Bahadurji: The Medical Needs of India.

TUESDAY (7th).—HOME FOR TREATMENT OF WOUNDS AND ULCERS BY OXYGEN (35, St. George's-sq.).—4 to 5.30 P.M. Demonstrations of Treatment, Apparatus, and Cases.

WEDNESDAY (8th).—NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Bloomsbury).—3 P.M. Lecture by Mr. Victor Horsley.

WEST LONDON POST-GRADUATE COURSE (West London Hospital, W.).—5 P.M. Dr. Abraham: Skin Affections.

THURSDAY (9th).—THE HOSPITAL FOR SICK CHILDREN (Gt. Ormond-st., W.C.).—4 P.M. Dr. Batten: Deformities of the Chest.

HOME FOR TREATMENT OF WOUNDS AND ULCERS BY OXYGEN (35, St. George's sq.).—4 to 5.30 P.M. Demonstrations of Treatment, Apparatus, and Cases.

SATURDAY (11th).—HOME FOR TREATMENT OF WOUNDS AND ULCERS BY OXYGEN (35, St. George's-sq.).—4 to 5.30 P.M. Demonstrations of Treatment, Apparatus, and Cases.

Notes, Short Comments, and Answers to Correspondents.

EDITORIAL NOTICE.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

The Index for the half-year ending June 27th was given in last week's issue, which completed the first volume of the year 1896. The practice of supplying loose copies has been discontinued, the Index having been placed in the centre of the journal, whence it can easily be detached, and placed either at the beginning or at the end of the volume.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1896 are now ready. Bound in cloth, gilt lettered, price 18*s*.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s*.

To be obtained on application to the Manager, accompanied by remittance.

A HOME WANTED.

To the Editors of THE LANCET.

SIRS,—Can any one kindly inform me of any institution or home where a lady in reduced circumstances, and who has lately undergone a severe operation, could be received and nursed if necessary? A payment of about 15*s*. a week could be arranged. A most deserving case.

I am, Sirs, yours truly,

June 27th, 1896. M.R.C.S.

L.R.C.P., M.R.C.S.—1. If the visits are social nothing can be urged against them. It is not advisable to be too ready to suspect that a brother practitioner has dishonourable motives. 2. For some posts canvassing is permissible, for others it is not, inasmuch as there is occasionally an interdiction on the practice which binds the honourable and leaves the unscrupulous free. Our correspondent does not say if canvassing has been forbidden in this case. If not it is clear that no one can say at what time it is correct to begin to canvass. 3. If this has been done it is wrong. But the accusation is a serious one and should not be brought without proof.

SCORPION VENOM.

To the Editors of THE LANCET.

SIRS,—Can you or any of your readers refer me to researches upon scorpion venom or to any detailed accounts of the effect of scorpion stings? Also, where I can get living specimens of "buthus afer" or other species.

I am, Sirs, yours truly,

June 30th, 1896. A. L. R.

AUTHORISED *v.* UNAUTHORISED MEDICAL SCHOOLS.

To the Editors of THE LANCET.

SIRS,—Coming up the Fulham-road the other day I saw a brass plate with "Medical College" on it, and wondering what medical college or school it might be I made inquiries, and found it was conducted by a man whose name does not appear in the "Medical Directory." He is, I find, a coach who prepares students for the various examinations. Now, is he not infringing the medical acts by so doing? And is he not encroaching upon the established medical schools by styling his place a medical college, or rather, I think, it was "West London Medical College"? Who ought to take this case up and whom should I inform? as one is, I think, justly jealous of the standing of our medical schools and does not like to see their position encroached upon. This man may be a successful coach for all I know, and one does not want to do him any harm, as he does not represent himself as a medical man, as far as I can see, by his plate. But how is one to distinguish between recognised medical schools and those kept by private individuals if this is allowed? I suppose in this case the law is helpless against the individual as there are no false pretences, but such a thing ought not to be. Would you mind giving me your opinion in your next?

I am, Sirs, yours faithfully,

June 29th, 1896. OBSERVER.

*** We do not know what the "Medical College" purports to teach, so cannot say if it unduly infringes upon the recognised medical schools.—ED. L.

P.C.—The letter will be inserted next week. We have been unable to find the references.

THE COOLIE TRADE.

To the Editors of THE LANCET.

SIRS,—I shall deem it a favour if any of your readers can inform me through the columns of THE LANCET as to whom one should apply to for an appointment as surgeon in the coolie trade. They are carriers, I believe, from India to British Guiana. I enclose my card and beg to remain, Yours faithfully,

Roman-road, Bow, E., July 1st, 1896. H. A. BRIDGMAN.

Dr. Louis E. Stevenson.—Until we have as definite proof of the efficiency of this plan of treatment as we possess in the case of the Pasteur method we should be loth to advise anyone bitten by a rabid animal to prefer the former to the latter.

"DOES ILLNESS HAVE ANY BENEFICIAL EFFECT ON ITS SUBJECT?"

To the Editors of THE LANCET.

SIRS,—In continuation of Surgeon-Captain Holt's letter I may mention that John Hunter ("On Blood Inflammation and Gunshot Wounds, 1812") talks of "the suspension or cure of a gonorrhœa by fevers"; and I saw a case of gonorrhœa temporarily held in abeyance by an attack of remittent fever when I was in the *Phœbe* on the east coast of Africa in January last.

I am, Sirs, yours faithfully,

Portsmouth, June 28th, 1896. W. E. HOME, R.N.

To the Editors of THE LANCET.

SIRS,—The subject referred to and exemplified by Surgeon-Captain Holt, A.M.S., in THE LANCET of June 27th, raises an interesting though obscure question in medical philosophy. Though somewhat analogous to metastasis it is, of course, a different thing, being the displacement of one disease by another, or, rather, the pushing aside by a more powerful disease of one that is less powerful. All such cases are worthy of record, in the hope that the underlying principle may some day become manifest. The following is an instance in point:—In July, 1885, I attended a female child aged five years, who had long suffered from chronically enlarged and indurated tonsils, which almost met in the middle line of the throat, for an attack of acute pneumonia. From the commencement of this attack I observed the throat particularly, being apprehensive that the obstruction in the fauces would increase dyspnœa and add to the gravity of the case. To my great surprise as the pneumonia advanced the tonsils became rapidly smaller, and at the height of the disease no enlargement was perceptible at all. The child recovered, and I found that after the crisis had passed the tonsils gradually enlarged again; this went on during convalescence, and by the time the child was quite well they had precisely regained their former size and had subsequently to be excised.

I am, Sirs, yours truly,

F. LUCAS BENHAM, M.D. Lond.

Elizabeth-street, S.W., June 27th, 1896.

M.R.C.S. (*Salford*).—Full information will be found in the Students' Number of the past two years.

A GOOD MODERN DISPENSARY.

To the Editors of THE LANCET.

SIRS,—Can you or your readers inform me where a good modern dispensary can be seen—one suitably built and fitted up?

I am, Sirs, yours faithfully,

June 23rd, 1896. W. T. N.

THE LATE MR. TOWERS SMITH.

To the Editors of THE LANCET.

SIRS,—It has been suggested by certain medical friends that a subscription list should be opened in aid of Mrs. Towers Smith, widow of the late Mr. Towers Smith, of 22, Harley-street, who is sadly in need of support. It is earnestly hoped that friends of the late Mr. Towers Smith will give their kind support to this most deserving appeal. The following have subscribed—

	£	s.	d.
Althaus, Julius, M.D. Berlin	2	2	0
Cagney, James, M.A., M.D. R.U.I.	1	1	0
Davis, Henry, M.R.C.P.	1	1	0
Hall, De Havilland, M.D. Lond....	1	1	0
Herman, G. E., M.D. Lond....	2	2	0
Rose, W., F.R.C.S. Eng ...	1	1	0
Savage, Geo., M.D. Lond.	1	1	0
Smith, Thos., F.R.C.S. Eng.	5	5	0
Startin, Jas., M.R.C.S. Eng....	2	2	0
Stephen, G. Caldwell, M.D. McGill	2	2	0
Turner, Aldren, M.D. Edin....	1	1	0

Subscriptions may be sent to Mr. Thomas A. Wethered, 36, Norland-square, Notting-hill, W., or to

Yours faithfully,

15, Harley-street, June 30th, 1896. JAMES STARTIN.

W. Sedgwick (Argon and Newton).—On the contrary we inserted the phrase "but that is another story" to show that Mr. Jacoby's bill was not mentioned in *Argon and Newton*, and the inverted commas were used to show that the phrase was taken from the works of another author—so well known that we did not mention his name—and that it was not our own.

H. W. is anxious to know whether there is any free seaside home into which he could get a former dispenser of his who is in bad health. He vouches for the case as one which is in every way deserving.

PRINCIPAL AND LOCUM-TENENT.

A MEDICAL practitioner who wishes to get away for a change is frequently deterred by the difficulties of transferring the charge of his practice, for during absence from home losses of patients and various complications are undoubtedly liable to occur. Still, the risk of unpleasantness may be minimised by care in the selection of the locum-tenent and by adequate instructions being given him. A man who wires to an agent to "send locum immediately," and meets the latter at the station saying, "Oh, I'm glad you've come, we're just off to Norway; you'll find the list in the surgery and the coachman will show you the ropes," has only himself to thank if matters go astray. Adequate time should always be allowed for a prolonged interview, during which the locum-tenent's qualifications and experience should be ascertained and the details of the practice explained to him. He should be told of any little idiosyncrasies on the part of various patients, and the whereabouts of drugs and instruments shown him—not forgetting such as are seldom wanted, such as the stomach-pump. He must be advised what to do in case any special appliance should be required and which of the neighbouring practitioners he may apply to in case of emergency. The duties appertaining to any appointments held should be clearly explained, and the certificate forms of all the sanitary authorities, as well as the forms connected with clubs, insurance companies, police, vaccination, poor law districts, &c., shown him. There are also numerous domestic, or semi-domestic, matters about which he will require information, such as the servants, the stable, the night-bell and door latch, the correspondence, &c. A few notes on all the above topics may advantageously be jotted down for reference. Enquiry should be made of him as to his likes and dislikes in the way of eating and drinking, bathing, and smoking, and efforts made to render him comfortable. If wages or other expenses are to be met by him enough cash for the purpose should be left with him, and the use of a lock-up drawer to keep cash in arranged for him. A locum-tenent's life is sometimes rendered unbearable by the children of the family being allowed to annoy him. It should be clearly understood that an engagement made by an agent is provisional only and not binding on either party until ratified after an interview. The principal may think the locum-tenent too young, too old, or too inexperienced for his particular practice; the locum-tenent, on the other hand, may find that, as is often the case in large cash practices, there is more work than he can pretend to accomplish satisfactorily, or that the domestic arrangements or surroundings are such as he considers derogatory or uncomfortable. In either case it would be best for the engagement to be courteously declined at once, some amicable arrangement being made about expenses.

Nervous.—The symptom is not at all uncommon and depends generally upon the condition of the blood. The family practitioner will be able to advise upon its significance and recommend treatment if any be considered worth while. He will also be able to assure our correspondent that he has assumed a pseudonym which is quite unnecessary.

DJAMBI.

To the Editors of THE LANCET.

SIRS,—I shall be much obliged if you or any of your readers can inform me through THE LANCET what "Djambi" is, also where it is to be had? I have been informed that it is used in Turkish hospitals as a styptic for wounds, also it is used for all slight cuts, such as those caused by shaving, in that country. I have applied to my drug house, but they state that they have never heard of it and do not know where to procure the same. The preparation was shown me by a gentleman as a styptic after shaving, and he stated that it had been given him by a Turk at Brussels, who stated that it was in common use in Turkey.

I am, Sirs, yours truly,

Narberth, June 29th, 1896. H. P. PRICE, M.R.C.S. Eng., &c.

Mr. J. Gunn.—We have not received a previous communication.

PROFESSIONAL SUICIDE IN RUSSIA.

ITALY in suicide, as in homicide, maintains a bad pre-eminence; but in professional suicide, in the self-destruction of votaries of the liberal arts, particularly medicine, she would appear to be out-distanced by Russia. From a statistical return lately published, suicide among practitioners of the healing art in Russia has reached alarming proportions—a distressing feature of the return being the comparative youth of the victims. The majority of them average between twenty-five and thirty-five years of age—all of them in the prime of life and full flush of their powers. An explanation of the phenomena is sought in the fact that the Russian medical man's lot is a peculiarly hard one. As in Italy, the profession is vastly overstocked in all the cities of the empire, and in consequence competition is exceptionally severe—so severe that a physician has been known to hold consultations from 8 A.M. to 11 P.M. in order to gain the reasonable income of 600 roubles a year. Besides, the Russian municipalities, seconded by the lay press, have instituted gratuitous consultations in public ambulances, by which the wealthy city of Kiev, for example, withdraws from the legitimate fees of the profession as much as 27,000 roubles per annum. There the poverty of the practitioner is such that he has been known to give advice for 20 kopecks (8*d.*) for each consultation.

Ajax.—If the medical man is willing to give, and the patient to pay for, a certificate to produce to the magistrate it is difficult to see why one should not be produced for the information of the School Board. We advise the patient in this instance to satisfy the School Board officer's natural demand. If he objects to the violation of privacy he may be glad to learn that it is probably unnecessary that such a certificate should name the actual disease, though if these facts were taken before a magistrate for decision we cannot prophesy what he might order.

M.R.C.S. (Shipdham).—Our advertisement columns very generally offer what our correspondent requires, and the advertisers will give information as to terms. If no one can offer residence as well as tuition it might be possible for the lad to attend classes and to board elsewhere.

Vaccination.—Yes.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

During the week marked copies of the following newspapers have been received:—*Western Daily Press, Mid-Surrey Gazette, Sydney Morning Herald, North Wales Chronicle, Sheffield Telegraph, East Anglian Weekly Times, Norfolk Daily Standard, Yorkshire Herald, Manchester Courier, Kidderminster Times, Halifax Guardian, Farm and Home, Sussex Daily News, Times of India, North Herts Journal, South Wales Daily News, Birmingham Post, Pioneer Mail, Newcastle Journal, Llandudno Directory, Leeds Mercury, Builder, Sanitary Record, Brighton Gazette, Architect, Yorkshire Post, Scotsman, Liverpool Daily Post, Southampton Times, Bristol Mercury, Weekly Free Post and Aberdeen Herald, City Press, Local Government Chronicle, Bradford Observer, Reading Mercury, Derbyshire Courier, Mining Journal, Courrier de la Presse, Hertfordshire Mercury, Gloucestershire Chronicle, Hebden Bridge and District News, Surrey Advertiser, Local Government Journal, The Morning, Daily Mail, Siam Free Press, Oswestry Advertiser, Estates Gazette, Lancashire Daily Express, Elgin Courant, Perthshire Advertiser, Derbyshire Times, Manchester Guardian, Evening Telegraph (Dundee), Auckland Chronicle, South Durham Mercury, St. Mary's Hospital Gazette, Kettering Evening News, Medical Record (New York), Hampshire Advertiser, Hampshire Independent, Middlesex and Surrey Gazette, &c., &c.*

Communications, Letters, &c., have been received from—

A.—Dr. E. O. Ashe, Kimberley, S. Africa; Messrs. Arnold and Sons, Lond.; The Apollinaris Co., Lond., Manager of.

B.—Dr. A. Byers, Pendlebury; Dr. F. L. Benham, Lond.; Dr. J. S. Bury, Manchester; Dr. A. G. Bateman, Lond.; Mr. W. B. Brodie, Farnworth, near Bolton; Mr. J. C. Bartlett, Teignmouth; Mr. M. L. Bensusan, Lond.; Mr. W. H. Bennett, Lond.; Mr. J. Bagley, Bath; Mr. C. Birchall, Liverpool; Mr. B. S. Bishop, Manchester; Messrs. Burgoyne, Burbidges and Co., Lond.; Messrs. A. and C. Black, Lond.; Bedford General Infirmary, Sec. of; T. B. Browne, Ltd., Lond.; *Birmingham Daily Post*, Editor of.

C.—Dr. K. Cameron, Aberdeen; Mr. T. F. Chavasse, Birmingham; Dr. S. Cassisi, Rome; Dr. O. W. Clark, Gloucester; Dr. F. C. Coley, Newcastle-on-Tyne; Dr. A. Cameron, Dennistown; Mr. L. V. Cargill, Lond.; Mr. W. H. Coates, Hull; Mr. C. Campbell, Saddleworth; Messrs. T. Christy and Co., Lond.; Messrs. Crossley, Moir and Co., Lond.; Messrs. Condy and Mitchell, Lond.; County Borough of Stockport, Medical Officer of Health of; City of Birmingham, Treasurer of; Children's Hospital, Nottingham, Sec. of; County Asylum, Whitecroft, Isle of Wight, Med. Supt. of; Chesterfield Hosp., Sec. of; Coventry Provident Dispensary, Chairman of; Cortland Wagon Co., Lond.

D.—Sir William Dalby, Lond.; Dr. B. M. Dockrell, Lond.; Mr. W. T. Desmer, Lond.; Messrs. A. De St. Dalmas and Co., Leicester; District Nurses' Home, West Ham, Hon. Sec. of; Domino, Lond.

E.—Dr. J. W. Edgar, Settle; Dr. G. Elder, Edin.; Messrs. E. and A. Elwin, Dover.

F.—Dr. W. R. Fenton, Kiltegan; Dr. T. H. Fiske, Aylesford; F. D., Lond.

G.—Dr. J. Gairdner, Crieff, N.B.; Mr. F. W. Green, Lond.; Mr. G. Goldstone, Barking; Mr. A. G. Gravatt, Lond.; Great Eastern Railway, Lond., Continental Traffic, Manager of; Gloucester General Infirmary, Sec. of; Glasgow Samaritan Hosp., Sec. of; Gamma, Lond.

H.—Dr. J. Harper, Lond.; Dr. G. Harley, Lond.; Surg.-Capt. P. Hearn, Hyderabad; Mr. W. Huntington, St. Andrews, N.B.; Mr. W. Hicks, Lond.; Mr. J. Heywood, Manchester; Mr. T. Garrett Horder, Cardiff; Mr. T. Hobday, Lond.; Mr. W. H. Haley, Lond.

I.—Incorporated Medical Practitioners' Association, Lond., Hon. Sec. of.

J.—Dr. O. Jennings, Paris; Mr. W. Jameson, Belfast; Joint Counties Asylum, Abergavenny, Clerk of.

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REPORT OF

The Lancet Special Commission

ON THE

RELATIVE EFFICIENCY AND COST

OF

PLUMBERS' WORK.

IN placing before the readers of THE LANCET the result of the labours of our Commissioners appointed to investigate the subject of the "Relative Efficiency and Cost of Plumbers' Work," and the criticisms and suggestions of the Special Committee of the Worshipful Company of Plumbers appended thereto, we may state that we had hoped to have published these conclusions some time ago, but the enquiry has taken longer than we anticipated. Few can be aware of the vast amount of detail with which both our Commissioners and the Committee appointed by the Plumbers' Company have had to deal, and we desire to express to them our thanks for the thoroughness with which they have considered the matter, and also for the large amount of time and labour ungrudgingly placed at our disposal.

We have been favoured with the following communication from the Plumbers' Company:—

The Worshipful Company of Plumbers.

1, Adelaide-buildings, London-bridge,
London, E.C., June 3rd, 1896.

To the Editors of THE LANCET.

GENTLEMEN,—I have the honour to hand you the report of the Committee appointed by the Worshipful Company of Plumbers to consider the report of an enquiry undertaken by you into the subject of "The Relative Efficiency and Cost of Plumbers' Work."

In publishing the same I have to request you to let it appear as the work of a Special Committee appointed by the Company for the purpose, and not as the work of the Company. The reason for this request is that the Company does not, in its corporate capacity, take any part in what may be regarded as "trade matters," but directs its efforts entirely to promoting the sound technical instruction of plumbers combined with the necessary arrangements for establishing an adequate system of registration and control over those men who are registered as qualified plumbers. The subject of "the cost of plumbers' work" is outside the purview of the Company's objects, but as it manifestly has an important bearing upon the sanitary efficiency of the work, the Company have had pleasure in appointing a Committee in accordance with your desire, believing that the information you propose to publish may convey useful information to members of the medical profession who are interested in the preservation of the public health, and serve a highly important public object.

I am, Sirs, yours truly,

W. R. E. COLES, Clerk.

REPORT OF THE SPECIAL COMMITTEE APPOINTED BY THE WORSHIPFUL COMPANY OF PLUMBERS TO OFFER CRITICISM AND SUGGESTIONS UPON THE REPORT OF AN ENQUIRY UNDERTAKEN BY THE LANCET INTO THE SUBJECT OF THE "RELATIVE EFFICIENCY AND COST OF PLUMBERS' WORK."

IN compliance with your desire that the Worshipful Company of Plumbers should appoint a committee to criticise and offer suggestions on the report you are about issuing, embodying the result of the inquiry you have made into the efficiency and cost of plumbing work, we have, at the request of the company, acted as an independent committee to deal with the matter, as the company do not take any part in questions relating to prices or other trade matters outside those connected with the training and registration of plumbers. We have examined the proof copy of your report with drawings and schedule of prices connected therewith, and we find:—

1. That the reasons stated in your report for the frequency of bad, defective, and insanitary work are generally correct.

2. That the defects indicated as existing in the typical houses dealt with in your report are of the kind commonly met with, although rarely, if ever, present in the same building at the same time, for houses so insanitary would probably be uninhabitable, therefore the defects may be assumed to be grouped under one roof merely for the purpose of illustration.

3. That the recommendations which are made in your report for new and altered work, respectively, are consistent with the requirements of modern sanitation and fairly represent the sound plumbing practice of the present day, except in some few comparatively unimportant instances (see Notes appended hereto).

4. That the prices and particulars stated in the estimates attached to your report are approximately correct for sound work in conformity with modern sanitary requirements carried out in houses of the construction illustrated in your drawings and situated in London. Prices for work executed out of London vary considerably—sometimes downward, from local wages being lower than those paid in London, sometimes upward, from travelling expenses and allowances being paid to workmen.

5. That the prices stated are liable to increase apart from fluctuations in the price of materials—some items to considerable increase, if the work specified were carried out in sections instead of at one time, as contemplated in your report.

6. That the report, taken as a whole, may be regarded as a unique work on the subject of the efficiency and cost of plumbing work, and is calculated, if studied attentively, to assist members of the medical profession, sanitary authorities, and others in arriving at a more correct judgment than commonly prevails as to the chief causes of the defective and insanitary plumbers' work frequently met with, and to afford them some useful information as to the cost of plumbing work which is sound in construction and sanitary in character. We are, moreover, of opinion that the Editors of THE LANCET are entitled to credit for having set on foot the first impartial and systematic inquiry into the matter, and especially for having grappled with the thorny and difficult question of *price*, which has an obvious, though often ignored, bearing on the *efficiency* of plumbers' work.

The committee desire to accompany these conclusions and findings of fact with the following observations and suggestions:—

(*a*) That, while there is no doubt that the prices set forth in the estimates may be, in some instances, higher than those estimated by well-known architects and surveyors, it is to be remarked that the prices which govern the estimates of these professional gentlemen are, as indicated in the report, mainly the prices quoted by persons tendering for work in keen competition and not those derived from knowledge of the actual cost of materials or of workmanship.

(*b*) That the cost of plumbers' work, even of the highest class, is comparatively a small item in relation to the total cost of a new house, and it has grown to be regarded as the item which can be squeezed down to the lowest limit, because the work of the plumber is less observable than the decorative or other part of the house which affects its letting value.

(*c*) That the prices of the accompanying estimates would yield but a moderate profit to the master plumber carrying on a large business with adequate capital, and at full trades union rates, but moderate wages to the workmen practising a skilled trade like plumbing, in which men are early incapacitated, from the character of their work, from following their calling, and are moreover liable to considerable sickness and a rate of mortality higher than in other branches of the building trades. (See statistics of Drs. Ogle, Farr, and Eben. Duncan.)

(*d*) That the best class of work, requiring more supervision and involving more labour and anxiety, leaves a relatively smaller margin of profit than work of an inferior kind, and from unforeseen difficulties in estimating for plumbers' work it has, in the experience of the committee, been carried out in not a few instances without profit, and in some cases at an actual loss, in order that it should not be below the standard of work creditable to a firm of reputation.

(*e*) That the class of work which the competent plumber would wish to do to meet the requirements of medical and sanitary authorities can only be efficiently carried out by men having had lengthened training as plumbers and experience in sanitary work.

(*f*) That the work of the plumber is of such a nature, and is now recognised as having so important a bearing on the health of the community, that it cannot reasonably be classed with other branches of the building trade and should be carried out under special regulations recognised by the authorities under the Public Health Acts.

(*g*) That the discrepancies frequently complained of in the cost of plumbers' work arise largely from differences in the construction of houses, the smallness of the jobs executed at one time involving loss of time to men going to and from work, and other special items of cost, and from other causes over which the plumber has no control.

(*h*) That the estimates accompanying the report should be useful as setting up a standard of approximate prices of sound sanitary work.

(*i*) That plumbers should be called to assist sanitary authorities in formulating regulations dealing with sanitary appliances and water fittings. To quote the words of Dr. Alfred Hill, medical officer to the corporation of Birmingham, in reference to the relation of the plumber to the sanitary authorities: "It is no use to have good sanitary arrangements and sanitary inspectors unless the plumbing work is well done. The health committees want really to make the plumbers their technical assistants."

(*j*) That architects are often placed in a difficult position by the difficulty of getting their clients to realise the importance of sound sanitary work, and therefore the plumber should be more directly responsible for the efficiency of his work.

NOTES.

Illustration, Fig. 27.—The form of trap shown is not the most approved. A trap of this kind should have a "cascade" action given by a vertical fall of not less than 3 in., causing the trap to be more efficiently cleansed. The fall shown in the channel pipe is also more than is necessary, 3½ in. being sufficient. It is noticeable that no allusion is made to the combined system of drainage which is known to exist in many instances, although highly objectionable.

Paragraph 16.—The deep trap in cold water service to cylinder is unnecessary.

Paragraph 36.—10 lb. soil pipe recommended is unduly heavy, 8 lb. being generally sufficient. In many cases 6 tacks are unnecessary, 4 being sufficient; they should be not less than three-sixteenths of an inch in thickness. The number of tacks to be used depends upon the position of the pipe.

Paragraph 45, Note S.—Where cost is not of the first importance tinned copper will be found the best material with which to line this sink.

Paragraph 50.—Enamelled copper is preferable to iron where the expense will allow, the additional cost being about £5 or £6.

Paragraph 53.—The insertion of the return pipe from top of house to cylinder is shown in Fig. 23 too low down. A great advantage is derived from placing a stop-cock in this pipe, to be turned off when the fire is let out, as it prevents loss by radiation by the water circulating during the night. A by-pass to connect the flow from the boiler to that from the cylinder will also be found an advantage for obtaining hot water rapidly after the fire is lighted. No particular boiler or details of the connexions are given, although the character of the boiler and the connexions are important items in regard to efficiency.

Paragraph 131.—It is cheaper to use iron oxide for coating the inside of pipes than galvanising.

Some other differences of practice might be pointed out, and some minor changes in construction and arrangements might be suggested in some few of the fittings recommended in the report, but none of these appear to the committee sufficiently important to call for particular comment, and, having regard to the scope and general objects of the report, the items referred to may be regarded as small matters for criticism in a report which, on the whole, deals so fairly and successfully with a large and difficult subject.

COMMENTS BY THE LANCET COMMISSIONERS ON THE FOREGOING NOTES.

Fig. 27.—Though the form of trap is not that in common use, nevertheless it has been proved to be a very effective one if used with the extra fall in the channel pipe as here shown. This fall, assisted by the contraction in channel and neck of trap, will undoubtedly clear same equally with the cascade action usually adopted.

Fig. 23, Paragraph 16.—This trap in cold service is no doubt somewhat exaggerated in the sketch; of course its object is to prevent the circulation of any hot water from the cylinder through this pipe.

Paragraph 53.—The question of the hot water system has only been lightly touched upon. It was necessary to include it in the report so far as it related to the supply to baths &c. The addition of the by-pass for hot water up stairs in the early morning, thus avoiding the loss of time in heating all the water in the cylinder, would be a distinct improvement. The use of the stop-cock in the return certainly tends to the same end, but in severe frosty weather the circulation would be of advantage at night to prevent freezing in the flow or return services.

THE RELATIVE EFFICIENCY AND COST OF PLUMBERS' WORK.

INTRODUCTION.

Insanitary houses.—The undoubted fact that an immense number of insanitary houses of all classes exist demands careful consideration, first, to trace the reason; secondly, to ascertain what suggestions may be offered to remedy the evil. To assist in elucidation the enquiry has been extended among the professions and trades concerned in building operations and sanitary work.

The first reason.—The first and great reason lies in the prevailing indifference and consequent ignorance of all classes as to the various sanitary appliances by which they are surrounded.

The second reason is the bad work and cheap materials put in many houses by either unqualified or unscrupulous men, encouraged by a dangerous practice of putting such work up to the distorted competition of all who may choose to tender for it.

The third reason, and one which has perhaps as much influence as any, is undoubtedly the cost of rectifying sanitary work.

The first reason is slowly being corrected by the gradual education of the public through the greater interest taken in the subject by the medical profession. The power of the profession for good would be increased if a larger number of its members would follow the example of many and use their influence, so far as their opportunities will allow, to suggest that the sanitary condition of the patient's home should be ascertained in an obstetric or serious surgical case; but this is a matter of great delicacy. The second and third reasons form the subject of these enquiries.

The second reason raises a question that bristles with difficulties. It is one with regard to which only those intimately connected with the building interest can be qualified to suggest a satisfactory solution. How far their hands may be tied by the demands of the public is also a question. One thing is obvious, viz., that since the general adoption of the present contract system houses are not, as a rule, substantially finished, and the work is not of a satisfactory character. When this is the case in connexion with the sanitary arrangements the effect upon the public health must be prejudicial, and a grave responsibility rests upon all who are in any measure the guardians of the public in these matters to enquire into the question. As in sport, so in the more serious concerns of life, an observer may see many things not noticed by those engaged in the contest, and be able to form a better general opinion, though some things possibly appear anomalous which a more complete knowledge would explain. That really sound, good work is the exception, and not the rule, cannot be doubted. The question is: Is this the fault of the men engaged or the system followed?

The architect.—Perhaps there is no profession that calls for such varied qualifications as that of the architect—qualities that are not very commonly found in combination, the qualities of the artist, the scholar, and the engineer. An architect should have considerable scientific knowledge, be sympathetic, that he may readily assimilate the ideas of his clients, and have plenty of administrative capacity. To use such a man simply as a task-master to wrest and screw work out of the contractor, as is done by the present system, is nearly equal to the employment of Michael Angelo in moulding an image of snow.

System of contracting.—The interests of the architect and the builder, as far as possible, should be one, and not, as at present, too often opposed. If a stranger to the system were to take up an ordinary memorandum of agreement to be signed by the contractor for the execution of some small contract, say, for £1000, the first idea would be one of surprise that a man who required to be so much controlled as this contractor should be employed at all. The contractor is evidently branded as a dangerous rogue, who will try every dodge, even to taking refuge in the Bankruptcy Court, in order to avoid the proper execution of the work. Nay, more, he must sign away his birthright in many cases, and the architects or arbitrators ruling must have the force of a rule of Court. Against this sombre background the character of the architect, shown in a few light touches, stands out in pleasant relief. In the course of this inquiry it has become apparent that the contractors are themselves much to blame for their anomalous position. In their anxiety to obtain work it is undertaken at prices which would yield no profit if efficiently executed, irrespectively of possible errors in calculation. There is the chance that something may occur to upset the contract, and in that event they may continue the work upon better terms; or, again, they may have a quantity of machinery that would stand idle unless the work were obtained, in which case their loss would be still greater. If a contractor enters upon work upon either of these conditions the natural tendency is to seek relief by "scamping" it in some form. The effect that this has upon the architect is very marked.

Standard of prices, how formed.—Young architects seldom obtain their information upon practical details and prices through having spent a certain period in a builder's office; their knowledge of prices, as a rule, comes to them second-hand, thus: With every tender that is accepted the contractor's priced bill of quantities is left with the architect, who therefrom collects schedules of all the *lowest* prices at which work is undertaken. It is an average of these prices that forms the standard in general use, and to which an architect or surveyor would refer if called upon to check or arbitrate upon an account. Such prices cannot be taken as a proof of the real cost of work properly carried out. Mistakes may have been made, and in quoting prices that are too low in competition the mistakes that secure the contract must be all one way, so that work done at these prices may often have resulted in a loss. Thus it happens the contractor who makes the most mistakes is the one who chiefly influences the architect on the subject of prices. Architects and surveyors who have graduated in builders' offices, and whose knowledge of prices is consequently greatest, are unable to stem the current of a vicious system of contracting. There is an inducement for architects to be unduly led by the wants of their clients, especially in the case of leasehold property. Cutting prices are accepted, as it is felt that the work, so far as their client is concerned, is not required to be of a very lasting character, and the builder's shortcomings are treated leniently. The natural desire of the architect leads him to design buildings of good elevation. The client is possibly anxious for internal accommodation. The funds at disposal being limited, the builder is cut down to the lowest point, and the system offers him every encouragement to send in his estimate at the finest possible price. The master plumber particularly suffers from this, as contractors now either employ men directly, or occasionally sublet to the master plumber the work whilst absorbing a part of his profit. The master plumber at one time could rely upon keeping a certain staff of picked men in constant employment. Now the contractor generally discharges the men directly they have completed the work in hand, and with this knowledge much of the interest the men formerly had in their work and their employer ceases. These remarks may at first sight appear irrelevant, but they are not really so: the tendency to cut down prices beyond a certain point leads to bad work. There is a great distinction between healthy and unhealthy competition.

Arbitration.—In all disputes that may arise over a contract an architect or surveyor is the arbitrator upon nearly all matters, including prices, for should these questions be taken into a court of law such details would not be dealt with by a judge, but be referred. It is, therefore, a matter of the greatest importance that the arbitrator should have his knowledge of values at first hand. The reference to a Court of Justice suggests a prominent example of the evil of the present contract system. Our new Law Courts are one of the most important buildings of the century, and a monument of artistic skill and industry. Upon this building the contractors spent some fifteen of the best years of their lives, and on its completion found their reward in the Bankruptcy Court—to the surprise, however, of no one. And why? Because the system allowed men to undertake the contract at about a quarter of a million of money below the next competitor. It is well known that great friction arose between the architect and builders, and there is little doubt that the worry entailed materially assisted in shortening the life of one of our most eminent architects and that of the builder also. Justice was, indeed, blind on this occasion.

Healthy and unhealthy competition.—The architect who is competent to arbitrate upon a builder's account is also

competent to say whether an estimate is fair and reasonable without pitting a number of men one against another. Where the architect exercises this power the best work is done, the inducement to scamp work being removed, and that to carry out the work satisfactorily remains as there is a reasonable hope of future work being obtained from the same architect. If, on the other hand, the architect's client hopes to gain an advantage by the mistakes or necessities of others, the present system of competitive contracting affords him every prospect of attaining that end. Such competition, however, tends more towards a low price than efficiency, the contractor knowing that no matter how well he may execute the work it will not insure him other employment from the architect unless his tender is again the lowest. That the quality of the work suffers is well known, as board schools and other buildings have been erected with drains unconnected with the sewer or other omissions of an equally injurious character. It is, indeed, to the credit of the professional men who administer such a system that so large a leaven of latent honesty still remains undemoralised in the trade itself.

The third reason.—The cost of rectifying sanitary work is certainly a very complex matter both from the householder's point of view and also from that of the plumber, and demands a thorough examination. Everyone dreads sending for the plumber. Discomfort and expense are associated with his name. A frequent subject of complaint is the excessive charges for small repairs. Some little matter is found to require immediate attention, and word is sent to the plumber's shop for a man to go at once. In these cases the charges made often seem out of all proportion to the work done, but people do not think or do not know that plumbers are not kept at a shop ready to be sent out like message boys at a moment's notice. "The immediately-wanted plumber" has possibly to be fetched from some distant building, where he is at work in connexion with other men. His removal often requires a rearrangement of their occupation till he returns, which event may happen too late in the day to be of any advantage to his employer. As a rule, the "immediately-wanted plumber" is a dead loss to his master. Prejudice against the plumber often arises from the man technically known as the "three" branch hand. Though he assumes to be a plumber, painter, and gasfitter he is really an odd-jobber, who dabbles in many branches, and by his inefficiency brings discredit on the name of the plumber.

Attitude of public towards plumber.—The plumber's lot is not a happy one apart from the unhealthy and ofttimes unpleasant nature of his work. Being regarded as a nuisance, he is frequently treated with scant courtesy, and this has a tendency to induce a hostile feeling not at all conducive to the interest of the persons who employ him. His every statement is regarded with suspicion, and should he point out any important defect in the condition of the existing work or the system, from the manner his remarks are received one would suppose the fault referred to was of his creation. He will perhaps be told that everything has been satisfactory for years, and asked why it should be wrong now. It appears this position is largely due to the bad practice of the plumbers themselves. It frequently occurs through a faulty joint in the connexion of a watercloset to a soil-pipe, an insufficient supply of water, or perhaps from want of cleanliness that a watercloset, otherwise a good one, becomes a source of danger to a house. In such a case more discretion should be used than is frequently exercised by the plumber, who at once often recommends the complete removal of the whole apparatus. It would be better, after attention had been called to the weak points of the apparatus, to correct the defect and either make a sound joint, change the flushing tank for a better, or clean the basin and trap with spirits of salts. It is found that the objections frequently raised in reply to the suggestions of the plumber are that: "The present sanitary system is a craze. What is the use of making these alterations? If made, we shall be told in five years' time they are all obsolete." But the more frequent is: "We have lived in the house for so many years and have never had anything the matter before."

Remodelling sanitary work.—In any plan to remodel this kind of work such appliances should be specified as are least liable to get out of order through the carelessness of a workman or the neglect of those under whose care they are placed. Patchwork in connexion with drains and soil-pipes is a thing to be avoided, but the practice of pronouncing condemnation wholesale upon houses because they are not fitted with the very latest improvements is found too much in vogue.

The expert.—On the other hand, the position of the man who is called in to act as a sanitary expert is a difficult one. Take one illustration: The authorities at a large school asked an opinion before the return of the boys. The expert examined the house and prepared his report. He found many points that were certainly objectionable in theory, yet his tests did not afford the strongest evidence of the existence of any possibly dangerous condition, and he naturally hesitated to suggest fresh work of an expensive character. The house, so far as he could tell, might be lived in with safety. The question in such a case is, Who is to take the responsibility? The masters very properly will not. The plumber argues, Why should he? If the work be re-done throughout he can be certain of its soundness, whereas there might be some defect in the old work that he had not discovered. In the event of an illness occurring which might in any way be caused or increased by a defect in drainage, those who would be probably called in to inspect would then condemn the whole system and the man who had passed the work. It appears that in practice this influences every report made, though there is no lack of houses where condemnation is fully justified. Excuses for not doing work are frequently many and curious. One well-known law lord is reported to have said, when some glaring defects in the drains under the floors in his country house were pointed out and a suggestion made that they should be laid outside, "that he preferred having the drains inside, because in the event of any defect he became aware of it sooner!" In this case, no doubt, cost was the great difficulty. The question is, Is this great cost necessary?

Question of cost.—For new buildings the present sanitary system costs comparatively little more than that of twenty or thirty years ago; but in adapting the new system to old houses the case is different. In order to avoid having long lengths of soil- and waste-pipes inside the house fresh positions have to be found for water-closets and housemaids' closets, bathrooms, &c., which have to be constructed often at considerable expense. In fixing new soil-pipes in old buildings frequently many difficulties have to be overcome, such as cutting away or avoiding timbers or iron joists, hot-water pipes, &c., whilst the services of a bricklayer and carpenter are constantly wanted. But, after all has been said, it must be admitted that the charges made for sanitary work in many cases leave much to be desired. What is required is a standard of charges that will yield to the master plumber a fair remuneration for capital and time employed, or some properly qualified board to whom at a slight cost an appeal might be made by either side to act as arbitrators.

Plumber's profit and loss account.—Let us consider the question of what is a fair and legitimate charge for this kind of work. If we assume that our plumber's business has a turnover of £6000 per annum it will be rather in excess of the average, and quite as much as one man could possibly look after in detail, it being made up of small amounts. If less is done the working expenses will be higher in proportion to the amount turned over. If more is done the expenses will be increased considerably by the employment of efficient supervision, and also the entire establishment will have to be conducted upon a much larger scale. To turn over £6000 per annum he will require £2000 capital, of which he will have to sink about £500 in plant, which will consist of scaffolding, ladders, swing-boats, and tackle; benches, plumber's fires, metal-pots, plumber's irons, and sundry tools not found by the men; vices, a small forge and anvil, &c., pipe-cutting and screwing machines, moulds, &c.; office furniture, van, trap, horse, pony, and harness. About £250 are sunk in stock of material and small fittings constantly required. He will want all the balance of £1250 as working capital, and must be smart in getting in his accounts in order to make that do. His working expenses will be made up somewhat as follows:—Horse and van and driver: pony and trap, with boy, for his own use; clerk and office boy, stationery, &c.; rent, rates, taxes, insurance, water, and gas; yard man, to look up and send out material, &c.; premises account, including repairs and waste time of men occasionally kept on in slack times; interest on capital and discount; depreciation of plant; gratuities and sundries, and will amount to, say, £800 per annum, without any allowance for law charges, bad debts, errors of judgment in estimating, or the numberless unforeseen items constantly likely to arise. After a very careful examination of figures it would appear that any man who works at prices based

upon those given in the following examples cannot (unless with a larger turnover than £6000) make more than some £300 a year, or 5 per cent. clear profit on the year's work. Unfortunately, in all cases the plumber cannot ensure even this modest profit legitimately, as in the case where work is done upon the present system under an architect. The practice is only to allow a gross profit upon actual cost of 10 per cent., but 10 per cent. (excepting in the case of large contracts, where it will pay) is a farce, as it cannot possibly cover the business working expenses. The condition of affairs is too often a duel between the architect and the contractor employed, the latter endeavouring to make a surreptitious profit by evading or "scamping" his work though the same is included in his contract or account. In the end the architect's client often pays a good deal more than 10 per cent. profit upon the work actually done, but the quality is inferior and every person connected with the transaction has been more or less demoralised.

Examples.—With a view to arrive at some definite conclusion three typical houses are dealt with in detail, the sanitary arrangements of which are supposed to require remodelling. The form of an ordinary report has been adopted, describing the condition of each house, while full notes are added for the guidance of the uninitiated and an estimate of cost is appended to each. The bills of quantities have been prepared in such a way that with a little care the approximate cost of any individual item may be arrived at. With this view most of the defects commonly found in houses have been concentrated in the examples given, whilst various forms of closets have been alluded to in order to give a choice. The work described is applicable to houses of any size, from a mansion to a cottage, though of course special treatment is often found necessary in factories, artisans' dwellings, and crowded courts; but these scarcely come within the scope of the present inquiry.

Illustrations.—It has been thought desirable, for the guidance of the reader, to illustrate certain of the closets and other appliances; these are, however, only put forward as types. It would obviously be unjust to the manufacturer of other forms of goods of equal merit if it were assumed that the particular ones indicated are those alone deserving attention.

The Examples.—The terrace houses shown are of the type to be found in London west-end squares, and are generally built upon one or other of the plans shown in the following examples marked Nos. 1 and 2. The plans show that the houses have equal accommodation. For the purpose of illustration it is assumed that all the closets, baths, and other sanitary appliances require renewal.

Example No. 1.—The estimate which follows this example shows amounts to £618 3*s.* 10*d.*, being greatly in excess of the cost of Example No. 2.

Example No. 2.—Owing to the position of the closets, &c., being more favourable the cost amounts to £377 10*s.* 2*d.*, the difference being £240 13*s* 8*d.* It would obviously be unfair then to draw any comparison of cost by simple enumeration of the number of closets, sinks, &c., which are the same in each case.

Example No. 3 shows the ground- and first-floor plans of a small suburban semi-detached villa. This allows us to keep the whole of the drains outside the house without difficulty, but here the question of expense assumes great importance. To suggest a similar treatment in all respects for the villa as proposed for the two previous houses would be impracticable. The estimate now shows the minimum cost for sound work. In this case the report is condensed, as it is assumed that the house is in an insanitary condition. It appears that the owners of this and a somewhat smaller class of property are often not in a position financially to place their houses in an efficient state of repair. If the house is not the property of the occupier he can by calling in the sanitary inspector compel the landlord to make good the defect, but he does so at the risk of receiving notice to quit.

General observations.—"The jerry-builder"—that is to say, the man who without capital or conscience has covered large areas of London with houses of the worst possible description during the last thirty-five years—is, of course, responsible for the greatest number of the insanitary houses which exist. Inquiry has failed to elicit any additional information to that which is common knowledge, but unskilled labour, cheap fittings, light iron, or even zinc soil-pipes have been freely used by him. The next largest number of insanitary houses have been built during this period under the system of general contract and unhealthy competition. The good effect of the recent London County Council by-laws is only just about to be felt, but the testing of all new drains with water by the sanitary inspector, the regulations as to ventilation, and the quality or suitability of material used cannot but have a beneficial influence.

Inspection having been neglected, or carried out by incompetent sanitary inspectors, has greatly facilated the operations of the unscrupulous contractors. A development of the system of house to house inspection now adopted by some of the urban sanitary boards, especially in the case of the poorer class of houses, would be a distinct gain.

To sum up the results of the inquiry as to the excessive charges made by the plumber, enough has been said to show that the work of renewal, especially in the larger houses situated in a terrace, entails a vast amount of labour, not only in the actual plumbing and drain work, but in alterations and reconstruction, if the work is to be carried out in accordance with the conditions of modern sanitary knowledge. Many of the larger fittings are costly, whilst there are numbers of smaller ones required (mostly out of sight) which, though inexpensive, individually help to swell the general amount. It is also noticed that the material throughout is costly, and the plumber receives 1*d.* per hour more than other mechanics in the building trade—viz., 10½*d.* per hour. The plumber, moreover, requires assistance. These are matters of almost general notoriety, and they are taken advantage of by unprincipled men to make exorbitant charges. The details given will answer a twofold purpose, furnishing a useful approximate guide to those who have sanitary work to be done, and to a great extent, it is hoped, helping to check abuse. The plans and reports will also offer to those who have no time to read through a technical manual a brief summary of the system adopted at the present time by most of the leaders of the plumber's craft, and which have, at all events in all their larger features, the approval of the architectural profession and also that of medical officers of health.

THE TERRACE HOUSE.

REPORT AND SUGGESTIONS ON EXAMPLE NO. 1.

1. *Slate roof* front and back; small lead gutters; and flat in centre.

2. *Rain-water Pipe* **A** carries off water from the front gutter, and is of cast iron and trapped at bottom, where it enters the drain.

Note A.—The joints of this pipe being open, any smell coming from the drain is likely to be drawn into the house through the adjoining windows. Excepting in very wet weather, when the trap at the foot is constantly recharged, the gases in the drain air may possibly pass through this trap, owing to the water in same becoming saturated in consequence of the want of ventilation in the drain.

3. *Recommendation.*—This pipe should be cut off at the bottom from the drain and connected with an easy bend and short length of pipe into side inlet of new gully **FF**.

4. *Rain water Pipe* **B**, from the flat between the two roofs, is of lead, and is a continuation of the soil-pipe from the w.c.'s **J** and **K**, pars. 22 and 25, on the second and third floors. This pipe is of 4½ in. diameter, and is trapped at the foot (see Par. 35); it finishes level with the gutter and is badly placed as regards the skylight over the staircase.

5. *Recommendation.*—This pipe should be carried down the same course as before, either in cast iron or lead, the latter for choice, and continued under the basement floor in 4 in. stoneware drain-pipe to deliver over the gully **FF** in the front area. This drain must be laid on a 6 in. bed of concrete, and the lead down-pipe connected with it by a brass sleeve piece or thimble. (Fig. 1.) (Also see Par. 36.)

FIG. 1.

Thimble.

6. *Rain-water Pipe* **C**, at the back, is of cast iron and carried down outside until it reaches the soil-pipe of the ground-floor w.c. **M**, par. 29, to which it is connected; this also is trapped at the bottom.

Note B.—This pipe is open to the same objection as the one in front of the house; but, though the trap at the foot is kept charged by the water from the w.c., yet the drain emanations from the foul soil-pipe through which no current of air can pass are a constant source of danger to the back rooms.

7. *Recommendation.*—This pipe should be disconnected and made to discharge on the flat over the study after removal of old soil-pipe.

8. *Flat over the study.*—Rain-water pipe **D** delivers on the flat over the kitchen and is disconnected.

FIG. 2.

Rain-water shoe.

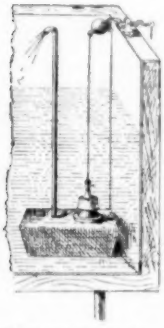
9. Rain-water pipe **E** from the lead flat over the kitchen is of cast iron and trapped at the bottom, and is immediately connected to the drain. (See par. 59.)

Note C.—In dry weather this pipe must be dangerous to those using the study and the morning room. (See Note A.)

10. *Recommendation.*—This pipe should be cut off from the drain and fitted with a shoe (Fig. 2) to discharge over the new flushing gully.

11. *Cisterns.*—There is a lead-lined cistern **F** in the roof holding 150 gallons; it supplies cold water to the housemaid's sink **Q** on the second floor and to the W.C.'s **J** and **K**, pars. 22 and 25, on the second and third floors, next the staircase. The waste from this cistern is trapped in itself and is connected with the adjacent soil and rain-water pipe **B**. A puncture has been made in the standing waste near the top in order to keep the trap recharged when the water is on from the main. This cistern is fitted with a service box for the supply of the top floor W.C. **J**, par. 22, has no lid, and has a large amount of dirt in it accumulated from the roof. It is presumed that the house has remained long unoccupied, otherwise the water company's regulations as to the overflow would scarcely have been evaded; but hundreds of similar cases exist where such regulations are not in force.

FIG. 3.



Cistern and service box.

Note D.—The connexion of this waste with the soil-pipe is quite unnecessary, and only offers an additional opportunity for the admission of bad air into the house. The puncture in the waste-pipe is a very uncertain precaution, as it depends entirely on the action of the ball valve. The practice of drawing the drinking water for bedrooms from the same cistern that supplies the W.C.'s is a great error, particularly as the third floor W.C. **J** is supplied by a service box (Fig. 3); the pipe from this to the closet is constantly charged with foul air from the latter. This is driven into the cistern from the air pipe in the service box by the descending water whenever the closet is used. As regards the second floor W.C. **K**, this, being a valve closet, is not open to the same objection, the valve being under the seat; the pipe between it and the cistern is constantly charged with water which rushes into the closet directly it is opened, affording but little opportunity for the passage of foul air back into the cistern.

12. *Recommendations.*—A dormer enclosure should be formed in the roof to hold the cisterns, as shown on plan, with a door on to the roof. There should be either stud and board or lath-and-plaster sides to keep out the dirt, and the sides and roof should be covered with 6 lb. lead. The warmth from the flues would assist to prevent the admission of frost. The dormer should be provided with louvres to admit fresh air, and with a wooden door to close the same in winter; it could be lighted from a skylight or sash, which should be made to open, as this would also light and ventilate the old W.C. **J**, which will now be used for housemaid's sink **Q**. This cistern **F** can be used exclusively for the supply of the W.C.'s, and must be moved to a fresh position for this purpose. A 1½ in. lead overflow pipe from this cistern should be provided to deliver into the external gutter. A 1½ in. stout lead service pipe should be carried down as far as the second floor, fitted immediately under the cistern with a screw-down stopcock. The cistern should be provided and fitted with a wooden lid.

13. *The Cistern* **G** *on Flat* is of slate and holds about 300 gallons. This cistern furnishes the supply for the hot water throughout the house as well as cold water for the bath and W.C. **L** adjoining the bedroom; the overflow discharges on the flat.

Note E.—This is open to the same objection as the last, as it supplies the hot water for kitchen use as well as the W.C.; it is badly placed in event of severe frosts.

14. *Recommendations.*—Provide and fix a new ¼th plate galvanised iron cistern **G** to hold 300 gallons in the new room provided and carry a 1½ in. overflow pipe on to the flat, and clear away old slate cistern.

15. This cistern **G** is to supply the hot-water system and the cold draw-off to the bath, and all sinks with the exception of the one in the scullery.

16. Connect a 1¼ in. lead pipe, with a 1¼ in. screw-down stopcock fixed in the same close to the cistern, and continue down to the basement with a 1 in. branch formed into a trap under the cylinder **H** in kitchen to prevent the return of the hot water. This stopcock must be protected or the key should be kept by some responsible person that this cock may not be tampered with. (See illustration to Par. 53.) Bring in a ¾ in. branch from this pipe to supply the housemaid's sink fitted with a screw-down high-pressure bibcock. Provide and fix a 1½ in. overflow pipe from this cistern to deliver separately on to the lead flat.

17. *Cistern* **H.**—There is a lead-lined cistern in the cupboard under the ground-floor W.C. **M**, which supplies the W.C. **N** in the scullery, the scullery sink **R**, the copper, and the sink **S** in the servants' hall. The waste of this cistern is trapped in itself, and is connected with the soil-pipe of the W.C. **M**.

Note F.—This is a most dangerous position for a cistern—viz., under a closet. As an example, one so placed where the lead trap of the closet protruded through the ceiling over the cistern was stopped up. A member of the household endeavoured to unstop it by means of a poker from the closet above. At last a hole was made in the trap, and finally its contents disappeared into the cistern below, as was discovered subsequently.

18. *Recommendations.*—This cistern **H** should be replaced by a 100 gallon galvanised iron tank, and should be fixed in the new larder to supply the scullery sink by an inch lead pipe fitted with a screw-down horizontal bibcock, and the overflow pipe should be carried into back area.

19. *Cistern* **I.**—There is an old cast-lead cistern **I** at the end of the front area which supplies the W.C. **O** in the vault, the pantry sink **T**, and the one **U** in the housekeeper's room; the overflow of this cistern is disconnected.

20. *Recommendation.*—This cistern must not be allowed to supply the sinks as well as the closet, and it is too large and too low to supply the latter. The value of the old lead will pay for a new 50 gallon galvanised wrought-iron tank fixed at a higher level for the supply of the W.C., which cistern must be covered round with hair felt and a wood casing to guard against frost.

21. *Main supply.*—Remove the present large lead service pipes to the several cisterns and carry up a ¾ in. lead service with necessary branches for the supply of the cisterns placed in new positions. Provide and fix, as required by the water company, a ¾ in. screw-down high-pressure valve in the area, and also an equilibrium ball valve to each cistern. Encase all pipes exposed in the area cellar and in roof with hair felt, bound with copper wire.

Note G.—To find a suitable position for the cisterns is a point frequently neglected. The place selected should be fairly light, warm, accessible, and well ventilated, also as free from dust as possible, and all should be provided with a wood cover. Neglect of this precaution is a reason why cisterns are sometimes found to hold such undesirable details as the remains of lost domestic pets, rabbits, guinea-pigs, or rats, mice, and birds. Again, lead should never be used to line cisterns in which potable water is to be stored, even when the pipes that lead to the sinks may safely be of lead. A piece of bright lead suspended in water or exposed to the air is quickly tarnished from the formation of a film primarily of lead oxyhydrate. This oxide is soluble in water to a limited extent. Fortunately London waters are hard, and mostly contain considerable quantities of sulphate and carbonate of lime, and form a protective coating largely consisting of carbonate of lead, which is insoluble in water unless it contains an excess of CO_2. But slight traces of lead may sometimes be found in waters that have been stored in lead-lined tanks. The action of this metal in minute doses upon the system is so gradual that the mischief is often referred to other causes, and for this reason its use should be abandoned. Where an old lead cistern is retained, it should be coated with a cement that will prevent the contact of the water. Galvanised iron tanks are now in general use in London, where the water is hard, but they are not so suitable for the storage of a very soft water (especially rain water collected in the neighbourhood of large towns). In this case the zinc used in galvanising the iron is decomposed, and floats on the top of the water. This action ceases, however, after a time. Slate is an excellent material to use for cisterns, provided the joints are not cemented with red lead (as is usually the case). Indiarubber packing may, with advantage, be used for this purpose.

22. *Water-closets.*—The third floor W.C. **J** on plan is unprovided with any means of light or ventilation, except on to the staircase. This is a pan closet, supplied by means of a ¾ in. lead pipe and service-box in the cistern in the roof (see Par. 11). There is a lead safe under the closet, with a waste from same carried into the side of the closet trap. There is also a D trap, par. 23, under the closet, with a hole in the top caused by a carelessly driven floor brad.

Note H.—Though the objections to the pan-closet are so well known and the future use of this closet is prohibited by the laws of the London County Council, thousands of them are still in use. The accompanying illustration (Fig. 4) will assist to give a clear idea of its construction. The soil is received into a small copper container or pan (which gives its

name to the closet), and into which the basin dips. This is worked by a lever and axle in connexion with the handle; the contents are thus thrown into the iron container in its passage to the trap. The condition

FIG. 4.

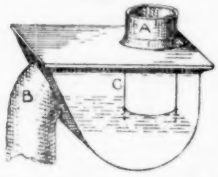
Pan-closet.

of the iron container after a few months' use can be better imagined than described, and the bad air from the container finds free access to the house through the hole in which the axis works.

It is one more unnecessary risk for the waste of the safe to enter the closet trap.

23. *The D-Trap* (Fig. 5).—As this is a kind of trap commonly met with, though its further use is prohibited by the by-laws of the London County Council and urban authorities generally, yet a few words in reference to it may not be out of place. 1. It does not readily permit the discharge of the whole of its solid contents every time the closet is used, whilst its capacity is large. 2. From its shape it offers a large surface for the accumulation of fur (urates, &c.), which soon impregnates the water and renders it very offensive; this large surface is subjected also to corrosion from the action of gases, which generally attack the dip-pipe A above the water line. A is the inlet or dip immediately connected with the w.c. apparatus, through which the soil passes into the trap; B the outlet or connexion between the trap, and the soil-pipe should be fixed close to the top of the trap as the lower edge of this pipe regulates the height of the water line. The bottom of A is made to dip into the water about an inch. It will at once be apparent that any gas that rises up B is confined in the space C, unless under pressure it can force its way through the water that seals the bottom of A. The only thing to recommend this trap was its large water seal when properly made and the resistance to syphonage offered by the confined air in C.

FIG. 5.



24. *Recommendations.*—The position of this closet, marked **J** on the plan, must be altered to one against an outer wall (see amended plan), provided with as large a window as

FIG. 6.

can conveniently be got to light and ventilate the same. The wood partitions that form the closet must be plastered down to the floor on each side before the skirtings are fixed. A good closet to use here would be an improved flushing rim short hopper basin supported by lead cone, fitted with an earthenware slop top, one with a lead pedestal and trap contrived as shown. (Fig. 6.) The slop top is not illustrated. As this can be used as a housemaid's slop sink, the floor under this closet should be covered with lead, with the front edge turned over a wood fillet and a 1¼ in. waste-pipe carried through the external wall and the end of the same fitted with a draught check. A 3 gallon syphon (wherever possible), silent, water-waste preventer may be fixed to supply the basin with water, with a 1¼ in. lead service to the arm of the basin fixed with cast lead tacks. This small cistern should be fixed as high above the closet as convenient, and is to be itself supplied by a small ½ in. branch off the 1½ in. down-pipe from cistern **F**, fitted with a ½-in. screw-down stopcock near the ball valve, for use in case of repairs. The ¾ in. overflow should be carried through the external wall. If a closet is used with an independent trap, it may either be a drawn-lead P-trap (Fig. 7) or an anti-D-trap (Fig. 8). The latter is somewhat less liable to syphonage, but as all closet traps must be fitted with anti-syphonage

FIG. 7.

Syphon Trap.

FIG. 8.

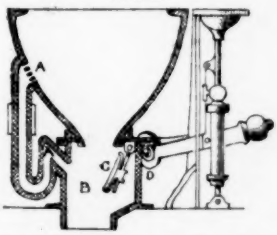
Anti-D-trap.

pipes (see illustration to Note o, Fig. 17), this point need not be considered overmuch. A 3½ in. branch soil-pipe weighing 10 lb. to the foot, soldered to the trap, is taken through the wall and connected with the new external soil-pipe. The anti-D-trap has the advantage of the square outlet, and the air-cushion formed by the corner A, which renders it somewhat less liable to syphonage than the syphon trap. If a syphon trap is used it must be of drawn lead. The cast traps frequently have a rough internal surface where the moulds meet in the casting, which forms an obstruction to the passage of soil and paper. They are also apt to be of an unequal thickness. The lead anti-D-traps cannot be made of drawn pipe, but are cast, and for this reason they should be carefully tested before use. It is only fair, however, to state that some firms make cast traps that are perfectly smooth inside.

25. *Closet* **K**. *Second Floor*, is situated like the last, as it is without any direct communication with the outer air. It is an old valve closet with a fan spreader instead of flushing rim, with overflow facing valve in valve box, which latter is not ventilated. It is supplied from cistern **F**, par. 11, by a ¾ in. lead service with a ¾ in. valve and brass regulator. There is a lead safe under it, with the waste trapped in itself and connected with the soil-pipe. This trap is kept charged by means of a small weeping pipe which is brought into action each time the closet is used. There is a D-trap under the closet, as in closet **J**.

Note L.—The general principle upon which this closet is constructed is still admitted to be one of the best, but the improvement made in recent years by the substitution of the flushing rim for the fan, and the reverse positions of the overflow behind instead of in front of the valve, greatly adds to the sanitary value of the closet. This will be best seen by reference to the accompanying illustration. (Fig. 9.) It

FIG. 9.

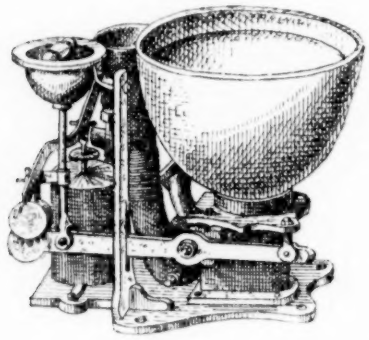


is obvious that if the overflow A enters the valve box B in front of the valve C, when the valve is opened some of the contents of the basin must be thrown into the pipe A where it enters B, but if it enters at D behind the valve this cannot happen. The flushing rim not only gives a larger water-supply, but acts with almost equal force on every part of the basin, which the old-fashioned fan-flush does not do.—When slops are thrown down the upper closet **J** some of the water is syphoned out of the D-trap under this (**K**) closet, and all the water is syphoned out of the trap in the waste of the lead safe, so that until **K** is used again and this trap recharged the foul air from the soil-pipe can freely enter the house through this waste-pipe.

26. *Recommendations.*—Form a closet over the well of the staircase, with the stairs and landing to reach the same as

shown on the plan, with external window with top and bottom sashes to open. Lay throughout the closet a tiled floor, and, should the funds permit, tile the walls also. If expense is of paramount importance, this closet may be properly cleaned and re-fixed, and a 1¼ in. ventilating pipe fixed in the valve-box, and carried through the external wall. The proper course would be to use a more effective modern closet. If a valve (Fig. 10) (also see Note J) it should be of best make with a flushing rim, with separate supply to the overflow pipe, and the valve-box should be ventilated by a 1¼ in. pipe carried through the external wall and cut short off outside. A 1¼ in. valve and regulator should be fixed under the seat. The supply to the basin should be by a 1¼ in. lead pipe connected with the 1½ in. down service from cistern **F**, par. 11, in which pipe, under the w.c. seat, a 1¼ in. screw-down stopcock is to be fitted.

FIG. 10.



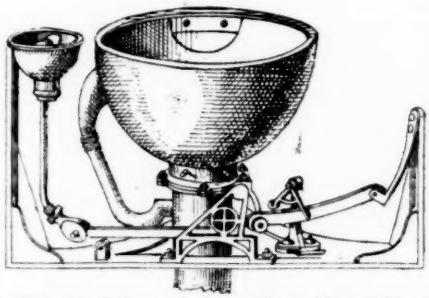
Provide a lead trap as described for **J** closet, and carry the branch 3½ in. pipe into the same external soil-pipe as from closet **J**. Provide and fix a 5 lb. lead safe with 1¼ inch waste-pipe through the external wall fitted with brass flap valve. The old mahogany seat and riser may be used again as far as possible, but the seat must be fitted and hung with brass hinges to afford ready access to the closet. The whole of the wood and plaster work under the seat and the under side of the seat itself also must be painted with three coats of oxide of zinc paint to prevent absorption and discolouration. Lay on the water from the new 1½ in. down service and provide the trap and branch to the external soil-pipe as described for closet **J**.

Note J.—The valve closets, though some object to them on account of their rather complicated construction, are, when of good make, the best closet for use in connexion with a lead soil-pipe. The two principal troubles that occur with them are (1) the irregular action of the regulator, which at times lets in either too much or too little water after the handle has been let go, and (2) the escape of the water that should remain in the basin on account of paper or slop refuse which gets between the valve and the seating and prevents its proper action. The first trouble generally arises through an accumulation of dirt and stale oil in the regulator, which, by the way, should always, if of the telescope pattern, be charged with glycerine, which congeals at a much lower temperature than oil. The bellows regulators are the most reliable in their action. The second difficulty is more often the result of carelessness in use. If the handle were held till the contents of the basin have been all flushed away it would not occur. The advantages of the valve closet are, first of all, that the weakest joint—viz., the connexion with the trap—is made on the right side, or rather the house side, of the trap. The closet holds a large quantity of water in the basin, which forms a second trap. The outlet is in the bottom of the basin, and there is never any difficulty in emptying it completely of its contents. In selecting a closet see that it complies with the following conditions: 1. It should have a white basin with a good flushing rim. 2. It should have a lead valve box and a ventilating pipe from the same. 3. The overflow should enter the valve box behind the valve and should have a separate service pipe to the charge trap, or no overflow, but a lip in the pan of the closet to the overflow into the safe, in which case proper provision must be made for same; but this last arrangement is not so desirable. 4. The handle should have a parallel action and should work so as to open and close the valve easily and without jerking.

27. *W.C.* **L**, *next to Front Bedroom.*—This is an old Bramah pattern closet (Fig. 11), supplied by means of a service box and a ¾ in. down pipe from the slate cistern on the flat. There is a lead safe under, with overflow into a small independent D-trap, the outgo of which is connected with the soil-pipe. The closet is fitted with a D-trap; the top of this trap is much eaten away and corroded.

Note K.—The old Bramah w.c. was the pioneer of the valve closet. The valve is fixed in the cistern, and this is worked by means of a wire and cranks. When the handle is raised some time elapses before the water from the cistern reaches the basin, according to the distance it has to travel; it has no flushing rim and has been entirely superseded by the valve closet. (See also Notes D and I and illustrations to same.)

FIG. 11.



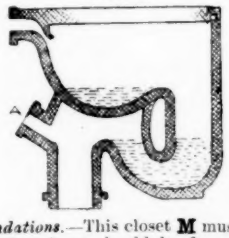
28. *Recommendations.*—Owing to the position of this closet in the centre of the house, and the difficulty of light and ventilation, it must be done away with entirely. In this particular case the adoption of this course presents no difficulty, as there is another on the same floor.

29. *Ground Floor W.C.* **M**.—This is a side wash-out closet, with basin and trap in one piece of earthenware, supplied by means of a small flushing cistern, which obtains its water from cistern **F**. There is no safe. The internal fittings of the supply cistern are all of iron. The cistern is very noisy when used.

Note L.—It may be taken as a rule that no closet should be used with an earthenware trap connected to a metal pipe, because the joint is made on the sewer side of the trap, and, although many excellent devices have been brought out and largely used, the risk attendant upon a fracture is one better avoided.

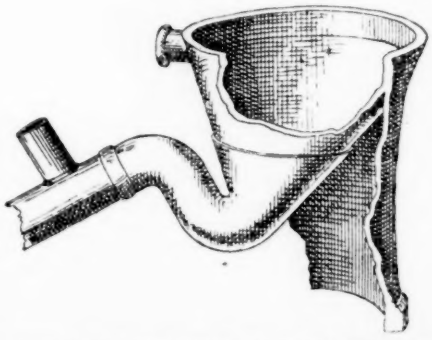
The wash-out closets, with either back, front, or side outlets (Fig. 12), rapidly fur up round the outfall into the trap; this fur soon impedes the passage of soil and produces an offensive smell. The trap is seldom thoroughly cleared, as the force of the water is expended or broken in the basin. The outlet of any closet should be in the bottom, so that the whole force of the water acts immediately so as to clear the trap.

FIG. 12.



30. *Recommendations.*—This closet **M** must be done away with also, and the closet should be formed in an altered position, as shown on plan, in order to place the soil-pipe outside and gain better ventilation; it should have a tile floor throughout. A pedestal closet may be used here, supplied by

FIG. 13.



a flushing cistern with copper fittings and silent valve, as described for w.c. **J**, with syphon trap and short branch into the external soil-pipe. The supply for this closet would be by an inch br nch from the continuation of the 1½ in.

service to the closet on the second-floor landing to the basement. Use a flushing cistern as described for Closet **J**, but with plated fittings to pull. There are several excellent pedestal closets to be had. The trap must be of 8 lb. lead, as before stated.

FIG. 14.

31. *Basement W.C.* **N** *in Scullery.*—The position of this closet is highly objectionable. It is intended to be ventilated by a skylight, the cord and quadrant of which are broken. The closet is one known as a hopper (Fig. 14), not with a flushing rim, and has an earthenware trap under the same. It is supplied from cistern **H** in the cupboard under the ground-floor w.c. by means of a cottage valve under the seat. Owing to the poor supply of water through this valve this closet is in a very dirty condition.

Note M.—No closet should ever be fixed in a room that communicates directly with another room where food is either prepared or stored. The closet must always be divided from such room by an enclosed lobby, which, as well as the closet, must have direct communication with the external air by either door or window.—A hopper closet with a fan spreader is invariably in a filthy condition, and in such a position as indicated on the plan would be a constant source of danger to health.

32. *Recommendations.*—Remove the sink **R** and closet **N**; cut away the lead flat over, and form an open area (as shown on amended plan) lined with white glazed tiles. Cut a doorway into the kitchen and build walls to form a new larder and scullery, both with glass partitions, to look into the new area. Alter partition walls on opposite end of scullery to enclose new sink, and provide for and fix window (to open) looking into middle area, as shown on corrected plan. Provide a door from the area into the larder for access from the kitchen; render the walls of the larder in cement and line with white glazed tiles, and fix slate shelves in same. Provide and fix in the centre of the lead flat over the kitchen a new lantern light and make good the flat after the removal of the old skylight. Build a brick partition across the end of the middle area and form a new w.c. (**N**), with either slate, zinc, or lead roof; form a window in the same to open, and provide a door which will show a 3 inch space at both top and bottom of the opening. Cement the walls throughout, and finish the floor with either stone, cement, brick, or tile. Provide and fix in same a white earthenware pedestal closet and trap, with basin with flushing rim and provide and fix a painted seat hung to lift up. Carry 2 in. anti-syphonage into new anti-syphonage-pipe from w.c. **M** connected with branch arm of closet **N**, with a brass sleeve piece (Fig. 1). The supply is by means of a 3 gallon flushing syphon-action water-waste preventer, with a 1¼ in. supply pipe to the basin fixed six feet above the floor of the closet, and this cistern is to be supplied by a ½ in. branch from the service to the ground-floor w.c. **M**, in which a screw-down stopcock is to be fixed.

33. *W.C.* **O** on the plan is of similar construction to the last one, but is supplied by a valve fixed in cistern **I**, par. 19, in the area, and connected with wires and cranks; the small head of water this gives is quite inadequate to the requirements of the closet. (See note on closet **N**, par. 31, *re* hopper closet.)

34. *Recommendation.*—A half-brick enclosure is to be formed in the vault and fitted with a door, cut short some 3 in. both top and bottom. If possible, place this enclosure at the side of the vault next the area with a 12 in. by 12 in. hole into same fitted with an open iron grating for ventilation; provide and fix in same a closet the same as described for **N**, but with an additional cistern to hold about twenty-five gallons, fixed as high as possible under the arch of the front door-steps and landing, to supply the flushing cistern. This cistern will be charged direct from the main.

35. *Soil-pipes.*—They are all of 4½ in. seamed lead and are much furred; each pipe is trapped at the foot by an earthenware S-trap. (Fig. 16.) The pipe **B** from closet **J** is also a rain-water pipe, and is continued up to the roof in lead throughout, but in the smaller diameter of 3½ in. The soil-pipe **P** from closet **L** is unventilated and is perforated on the top of the short horizontal length next trap. It passes down into the drain in the wine cellar in the same casing with the hot-water pipes, the heat from which and from the hot water from bath (see par. 49) has expanded and contracted the soft lead until at the joints the lead has torn away from the harder metal and produced a fracture which extends half round the pipe. Again, where this pipe passes through the brick wall it is much decayed owing to its contact with lime or cement used in the wall. All lead pipes should be covered with tarred felt when in contact with cement or lime. The soil-pipe from the closet **M** is carried up through the lead flat over, where it is connected with the iron rain-water pipe **C** from the main roof.

FIG. 15.

P TRAP

FIG. 16.

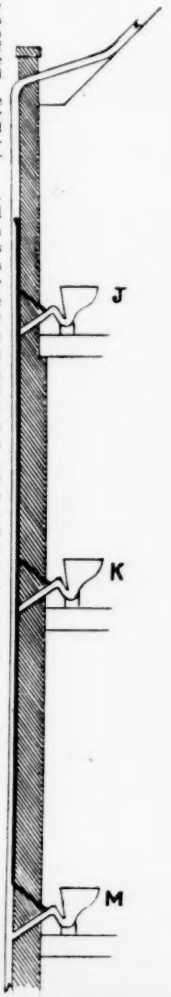
S-trap.

Note N.—Except in cases where long lengths of soil-pipe have to be carried horizontally it is better that the diameter should not exceed 3½ in. This size pipe never becomes foul like one of a larger size, for the reason that a given quantity of water exerts a much greater mechanical force upon the sides of the smaller pipe than is the case in one of larger size. Its velocity and carrying power are much greater in the contracted space than is the case in the larger pipe, where it frequently happens that portions of soil adhere to the sides, while the water spreads to and runs off in other parts of the pipe.

The corrosion noticed in soil-pipe **P**, par. 27, is caused by the entire absence of ventilation, and the consequent non-removal of soil gases, as ammonia, carbonic acid, sulphuretted hydrogen, &c. The gases generated in the foul soil-pipe act more readily upon the upper part of the horizontal pipe and D-trap (which is never touched by water) than upon any other part of the pipe. The lead gradually crumbles away on the inside until it becomes as thin as a piece of paper, when small powdery excrescences appear upon the outside surface, which, upon being rubbed off, show a perforation. Seamed soil-pipes such as these often rapidly decay in much the same way at the side of the seam; this is no doubt aided by a galvanic action set up between the soft lead and the hard tin of the joint.

As already explained, serious damage to this pipe was caused by the proximity of the hot-water pipes. Had these and the soil-pipe been coated separately with asbestos or some other good non-conductor, it is more than probable that the soil-pipe would not have been damaged.

FIG. 17.



Anti-syphonage Pipe.

36. *Recommendations.*—A new 3½ in. 10 lb. lead soil-pipe **BB** should be fixed at the back of the house, to which in its course will be connected the branches from closets **J** and **K** and **M**. Its upper end should be carried up over the parapet to about 2 ft. above the ridge; this pipe must be protected by a wood casing where it crosses from the parapet to the roof, and it must be fitted at the top with a copper-wire guard. Each length must be provided with six cast-lead tacks, weighing about 7 lb., each soldered on the soil-pipe in pairs at equal distances throughout. The bottom of the pipe must be fitted with a stout brass thimble, soldered to same for connexion with the iron branch to manhole. The use of this thimble is twofold. It prevents the compression of the lead after the joint has been made with the drain, which would fracture the joint, and it also prevents contact of the cement used in the joint with the lead, and subsequent destruction of the lead from this cause. When the drain is of iron it is impossible to make the connexion without a thimble. (See illustration par. 5.)

37. A strong lead 2 in. anti-syphonage pipe must be carried up at the side of the soil-pipe from the branch soil-pipe, just above the trap of the bottom closet **M**, and the same may be connected into the soil-pipe a few feet above the branch of the anti-syphonage pipe from the closet **J**. closet **K** must also be fitted with a similar branch pipe, as shown on sketch.

Note O.—The action of the anti-syphonage pipe is as follows. We will suppose a stack of soil-pipes (Fig. 17) say 50 ft. or 60 ft. high, with three closets connected into it one above the other (of course, should the soil-pipe be unventilated or badly ventilated at the top the chances of syphonage taking place will be greatly increased). A pail full of house slops is thrown down **J**, which completely fills up the aperture of the soil-pipe. As it rushes down a vacuum is created behind it, while the air in the pipe in front is violently compressed, with the result that the water in traps **K** and **M** is greatly agitated with compressed

air (which may pass through the trap) in the first instance, and then very probably be sucked out by the vacuum created after the falling water has passed the traps, whilst **J** stands a chance of being sucked dry also. With the anti-syphonage pipe this cannot take place, as the compressed air will find relief up this pipe before the water has passed each closet and also draw air down same afterwards instead of first emptying the closet traps to draw the required air from the room.

38. *Sink* **Q**.—There is a small lead-lined sink under the stairs on the second-floor landing, the 1 in. waste-pipe from which is connected into the side of the D trap of w.c. **K**. The cold supply is from cistern **F**, par. 11.

Note P.—This is a very bad position for a housemaid's closet. Any place in which slop-pails, &c. are kept should have plenty of light and ventilation, all of which are here absent.

Lead is by no means the cleanest material with which to line a sink where water-bottles for use in the bedrooms are to be filled.

The connexion of the waste with the D-trap of the closet is a grave error; no waste of either sink, bath, or lavatory should ever have any direct communication with the drain.

39. *Recommendation.*—This sink must be done away with.

40. *Sinks.*—A fireclay enamelled sink (**Q**, third-floor) is to be fixed in the housemaid's closet under the new cistern room, formerly w.c. **J**, with a 1½ in. strong lead waste-pipe, and a cast-lead syphon trap fitted with a brass cleansing screw must be fixed in the waste immediately under the sink. This waste-pipe is to be carried down to the basement at the side of rain-water pipe **B**, par. 5, fitted at the bottom with a brass thimble, and continued in a strong iron pipe with caulked lead joints under the floor of the passage and pantry into the front area, where it delivers over a gulley. The upper end of this pipe is to be carried up in the cistern room and through the lead flat over, where it finishes about 12 in. above the flat, the end being fitted with a copper-wire cover. The trap must be provided with an anti-syphonage pipe connected with the ventilating pipe. Hot and cold screw-down handed bib-taps must be provided. The cold supply comes from cistern **G**, par. 15. A small ½ in. branch must be connected with the rising main with a screw-down, high-pressure bibcock on same. (See par. 123.) The whole of the floor of this closet should be covered with 7 lb. lead close, copper-nailed round and across.

41. *Sink* **R** *(Scullery).*—This is badly lighted from a fixed skylight. It is a stone sink with a movable brass bell trap (Fig. 18) connected by an upright length of stoneware pipe to the drain. The cold supply is taken from cistern **H**, par. 17, through a ¾ in. lead pipe, and the hot supply from the bath circulation, which is supplied from the slate cistern **G**, par. 13.

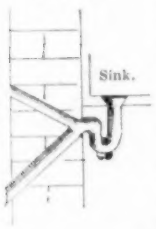
Note Q.—Its position next to the w.c. and want of light and ventilation at once condemn it. Stone sinks are absorbent to a certain extent and are therefore more difficult to keep clean than those made of enamelled earthenware.

The old bell-traps are happily almost extinct—as very few firms make them—but they may be met with occasionally. The top, or bell, is movable and is seldom in its place. The position it occupies is not, however, of much moment, as it generally traps ½ in. into about 2 oz. of water. The direct connexion with drains is of course an evil—aggravated in this case by the use of an upright drain pipe above the ground, which would be additionally liable to fracture of either the pipe or the cement joint.

FIG. 18.

42. *Recommendations.*—The alterations shown on the amended plan and described under w.c. **N**, par. 32, will give abundant light and air to this scullery. After the removal of the old sink and all connexions, including the hot-water supply, fix a glazed stoneware sink **R** with a 2 in. stout lead waste-pipe, fitted with a lead syphon trap, which with cleansing cap and screw should be carried through the external wall to discharge into the flushing gully. (See Drains, Note zi.) A 1½ in. anti-syphonage or puff pipe (Fig. 19) is to be connected into the waste just by the outgo of the trap, carried through the external wall, and cut short off with a + copper wire fixed in the end. Provide and fix screw-down bibcocks to hot and cold supply, and continue branch from former to supply sink in new position. (For the latter see cistern **H**, par. 18.) Provide a draining board, fixed under the plate-rack, to carry the water from same into the sink, cover with pewter.

FIG. 19.



43. *Sink* **S** *(Servants' Hall).*—This is a lead-lined sink, much worn and patched. The 1 in. waste-pipe passes into a 6 in. D-trap, and is then connected into the drain. It is supplied by cistern **H**, par. 17, with cold water and hot water from the bath system.

Note R.—The use of the D-trap under this sink, although less objectionable than when used in the larger size under the closet, must be condemned. It is not only dirty in itself, but it retains an unnecessary quantity of dirty water.

44. *Recommendations.*—A deep glazed stoneware sink should be fixed here, fitted with a brass plug waste; the waste-pipe to be 1½ in., strong lead, with proper syphon-trap under the sink and brass cleansing cap in same. The waste should be carried through the external wall to deliver over the new gully **Y**. A short 1 in. anti-syphonage pipe should be fixed just above the trap and brought through the external wall with + copper wires fixed in the end of the pipe. Lay on a ¾ in. branch stout lead pipe from the 1¼ in. down service from cistern **G**, par. 15, fitted with screw-down, high-pressure, horizontal bibcock, and provide a new cock of similar pattern for the hot-water service.

45. *Sink* **T** *(Pantry).*—This is a lead-lined sink, as the last, but the cold supply comes from the lead cistern **I** in the area.

Note S.—It will be more convenient to have this sink, which is used principally to wash glass at, lined with lead, and the draining board covered with pewter. The sink should be made with a division across the centre, as a double one.

46. *Recommendations.*—Remove the old sink and waste, &c. Provide a double sink lined with 6 lb. lead sides and 8 lb. bottom, fixed in the window recess. Each sink is to be treated in all respects as sink **S**, with the addition of covering the board under the bottle rack with pewter.

47. *Sink* **U** *(Housekeeper's Room).*—This, a small lead-lined sink fitted into the window recess waste, has no trap and is disconnected over an external gully. Supplied from cistern **I**, par. 19. No hot supply.

Note T.—It is objectionable to have a sink waste, even if disconnected from the drain, without a trap. The smell from the accumulation of stale soap in the pipe is drawn into the room accompanied by effluvia that may arise from the dirty water in the gully. A glazed fireclay sink is much better and cleaner for this room. In the case of the servants' hall, the dishes, &c., used for the servants' dinner are washed there, and a deep sink is necessary for the purpose, whilst in the scullery large tubs are chiefly used and a deep sink would be inconvenient.

48. *Recommendations.*—Provide a small enamelled fireclay sink with 1¼ in. waste-pipe, carried into **HH**, properly trapped and ventilated as the last. Bring a ¾ in. branch lead pipe from the 1¼ in. down service from cistern **G**, par. 15, and provide a ¾ in. screw-down horizontal bibcock as before.

49. *Bath.*—The room in which this bath **V** is placed is very dark; there is no window, and only a borrowed light from the fanlight over the door on to the landing. This is a zinc painted bath enclosed with a mahogany framed casing and top. The hot and cold supplies are brought into a box under the waste in the bottom of the bath, and are, with the waste fitted with ground-in full-way plug-cocks, worked by long iron keys and cranked handles fixed at the head of the bath. There is a lead safe under the bath with a sunk well and small lead D-trap under. The waste from this well is carried into the soil-pipe **P** of closet **L**, par. 35. The waste and overflow of the bath are carried from the box in the bottom and deliver over the top of the trap in the well of the safe. The cold supply is from cistern **G**, par. 13.

In large establishments, where possible, a second bath for servants' use should always be specified.

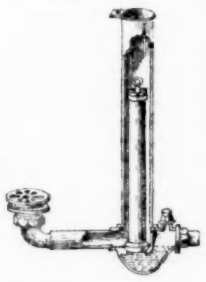
Note U.—To allow the hot and cold water to enter up the waste into the bath is a very bad arrangement, and a breach of the London water companies' regulations. There always remains a small quantity of dirty water in the waste, between the inlet and the waste cock, which washes back into the bath when the hot or cold taps are turned on. The proper plan is to fill the bath by over-hanging taps at the foot, immediately over the spot where the waste outlet should be fixed. The waste of the bath should not deliver over the well of the safe, as by this arrangement the bath takes a much longer time to empty than it should do; the dirty water is also apt to flow back into the safe, and the stale soap left behind in the tray smells.

50. *Recommendations.*—The ceiling and lead flat over should be cut away, and a large skylight with the centre to open should be fixed on lead flat, after the removal of cistern **G**, par. 14, as shown on plan. A portion of the floor of the box-room should also be cut away, and a stud partition, lathed and plastered on each side, should be fixed across the end of this room to form a shaft to light and ventilate the bath-room. The old w.c. **L**, par. 28, should be done away with entirely, and the partition between it and the bathroom removed and the work disturbed made good. A best enamelled cast-iron parallel bath (**V**), 5 ft. 6 in. long, should be fixed in place of the existing zinc one, and a new mahogany top fitted to same, or the old top adapted if possible. The old lead safe should be removed for the necessary alterations to the supplies and

waste; it can then be repaired and refixed, and a 1¼ in. overflow carried under the floor of the back bedroom, to deliver through the external wall, the end being fitted with a flap valve. Should the position of the joists be found to prevent this, this overflow may be connected with rain-water pipe **B**, par. 5, under the stairs, but the former way is much to be preferred.

51. The 1½ in. lead-bath waste **P** should be carried down in casing with hot-water pipes continued under the floor of the servants' hall into a strong 2 in. cast-iron drain-pipe laid on 6 in. of concrete, to deliver over the gully **X** in the middle area. The connexion between the lead and iron pipes should be made by means of a brass thimble, par. 5, and a caulked metal joint, the lead waste to have two strong cast-lead tacks fixed every 5 ft., and protected from the hot-water pipes by a coating of asbestos. The waste may be fitted with a patent quick action, with secret overflow—i.e., improved copper waste with trap. (Fig. 20.) This waste should be continued up in the corner of the new air shaft and carried to about 5 ft. above the lead flat and finished with a + copper-wire guard.

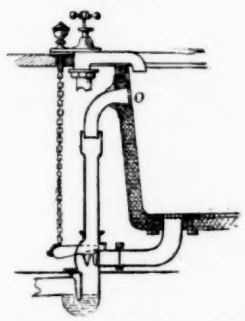
FIG. 20.



Note v.—The bath waste is still a matter of difficulty to the plumber. The principle usually adopted is shown in illustration No. 20. It will be seen that the internal tube, or standing waste, regulates the height at which the water will stand in the bath. Directly the water rises above the level of the top of this tube it escapes down it into the trap and waste-pipe below. The bottom of this tube is usually provided with an india-rubber seating, and forms the seal that retains the water in the bath. Upon lifting this tube, which is done by means of a short chain and handle, the whole of the water escapes. The great objection to this arrangement is that soapy matter accumulates in and around this standing waste, and there is usually considerable difficulty to gain access to the interior to clean it. In selecting a bath it should be borne in mind that ready access to the inside of this waste is an important feature. A large majority of the baths sold have a somewhat similar arrangement to the above, cast in iron at the end, as part of the bath. In this soapy matter accumulates even more quickly than in the copper waste.

The illustrations show two attempts that have been made to mitigate the evil of the standing waste. In Fig. 21 a lever valve, similar to that used in a valve closet, is fixed at v to retain the water in the bath. This arrangement leaves a clear course to the trap and waste for any water to escape down the overflow pipe o, and to which there is a ready means

FIG. 21.



of access, provided, at the same time, it does away with the objectionable practice of allowing the overflow to be filled with more or less dirty water.

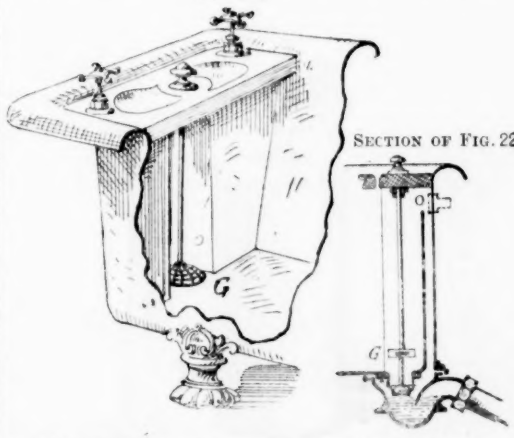
Fig. 22 is one of the simplest arrangements if, instead of the standing waste shown in the diagram, a separate, short overflow connected at o is carried through an external wall with a draught valve on the end. This pipe should also be fitted with a brass cleansing cap and screw, though as a matter of fact a bath is seldom filled so full as to overflow.

In the illustration the overflow tube under o forms part of the casting of the bath, as this enters the trap on the outfall side of the waste plug. The water standing in the bath cannot circulate in it, as is the case in the first illustration. No doubt when the plug is lifted some water would wash up into this overflow tube, but to cleanse this a small flush-pipe is fitted to deliver over the top, which acts whenever one of the taps is used. The trap is of cast iron, made with a vitreous lining, and the grating that conceals the plug is fixed with a bayonet joint, and can be easily lifted up to cleanse the trap. This arrangement is not, however, supplied separately from the bath. Considerable care should be used when fixing iron traps or pipes that have vitreous linings that the lining is not broken, otherwise their utility is destroyed.

The cold supply should be by a 1 in. lead branch from the 1¼ in. down service from cistern **G**, par. 15, to the basement.

The hot-water supply should remain, but the taps would each be plated, overhanging, screw-down taps. If a lever tap is used vibration often occurs, though this may be pre-

FIG. 22.



SECTION OF FIG. 22.

vented by the use of an air vessel at the end of each supply pipe.

52. *The Hot Water System.*—The hot water is supplied from the kitchen boiler by a 1 in. iron flow and return pipe to a 50 gallon closed galvanised iron tank fixed in the bath-room, from which an exhaust pipe is carried up to above the level of Cistern **G**, par. 13, and packed with felt. A trapped branch is carried from this cistern into the return pipe to the boiler immediately under the cistern, whilst a small pipe is continued from the flow pipe to supply the housemaid's sink **Q** under the stairs. There is no safety-valve to the kitchen boiler.

Note w.—The supply of the cold water for the hot water system should not be drawn from the same cistern as that which supplies the w.c. (as in this case). The position of the exhaust-pipe is one fraught with great danger, especially as no safety-valve has been provided to the kitchen boiler. The level of the water in this exhaust-pipe will be the same as that of the water in cistern **G**. If the range was in constant use, and the water in this pipe kept above freezing point, all would be well; but in time of severe frost, if the fire had not been alight for a time sufficient to allow the water to freeze in the exposed exhaust pipe, and should the cold supply also be frozen, when the fire was lighted nothing could prevent a disastrous explosion. Again, a 1 in. flow and return pipe from the kitchen boiler is too small; should both the ends become choked by fur an explosion would result.

A much better supply of hot water can be had from a large cylinder fixed close to the kitchen range than by the present arrangement of the hot-water tank in the bathroom. The exhaust-pipe should be turned over the top of the supply-cistern in the roof and covered with felt.

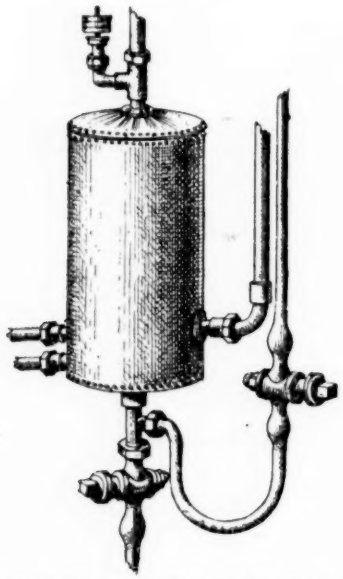
53. *Recommendations.*—1. Disconnect the present hot-water pipes from the kitchen boiler. Fix at the side of the kitchen range, on a strong wrought-iron frame or on brackets, a 50 gallon strong galvanised iron circulating cylinder, **II** on plan. (Fig. 23.) Drill for and connect this with the boiler by a 1½ in. flow and return steam-tube, and connect the service, properly trapped, from cistern **G**, par. 15, into the return pipe. Provide a strong gun-metal stopcock to shut off the cold supply with a square-head and spanner, which should be fixed above the trap in the cold supply. (This spanner must be in the charge of some responsible person, that the cock may not be tampered with and an accident caused.) Bring down a short length of pipe with bibcock on end to empty cylinder; connect the old 1 in. flow-pipe on to the top of the cylinder and the old return pipe into the lower part of it. Encase the cylinder with asbestos (to prevent loss of heat), and leave the inspection plate to same free. Carry up a short 1½ in. pipe from the top of the cylinder and fix on the end of same a dead-weight safety valve. In this position the valve will be more accessible, and less liable to become corroded with dirt, than if placed in the chimney; or should the valve be taken directly off the boiler, which most authorities insist upon, it should be brought through the chimney breast. When the boiler is charged lift the weight of valve, that this pipe from the boiler may be charged also, or steam will generate in it.

Note x.—Should the position of the cold-water cistern ever render it likely to be affected by frost, this arrangement must be modified by fixing a small disconnecting cistern, in some lower and more sheltered position, just above the level of the highest point, for drawing off the

hot water. This will reduce the height of the water in the exhaust-pipe. At the same time it is best for the cold supply to enter the hot-water system as illustrated.

More attention than is customary should be given to the periodical removal of incrustation from kitchen boilers. The fur that adheres to the apparatus not only acts as a non-conductor of heat, which results in waste of fuel and damage to the boiler, but the orifices of the pipes

FIG. 23.



connected with it often become so choked as to prevent the circulation of the water, and increase the risk of an explosion. The more efficient the apparatus the oftener will it require attention. The hardness of the water and the quantity used will also make a great difference as to how frequently the boiler should be cleaned. This must be a matter of individual experience.

54. *Recommendations.*—1. Remove the old hot-water tank **AA** from the bathroom and continue the flow- and return-pipes to supply the housemaid's sink **Q**, with a 1 in. branch from the flow to supply the bath **V**. Provide a screw-down ¾ in. bib-valve to supply the sink. Connect and continue exhaust pipe up into the cistern room and turn same over the cistern **F**. **The use of a small expansion box is very desirable at this point, otherwise if the apparatus is efficient a good deal of the hottest water will overflow into the cold water cistern through the expansion pipe.** Where these pipes pass in the same casing with lead pipes, they must be covered with asbestos or other good non-conducting material (see par. 35). Provide a screw-down stop cock fixed under the bath in both hot and cold services.

55. *Drains.*—The drains throughout are of soft earthenware pipe, badly jointed in mortar. The main drain from front to back is a 9 in. pipe, and is laid in an old brick barrel drain, the top of which has been removed; the principal branches are of 6 in. pipe, and the smaller ones of 4 in. The branch drains have been laid without concrete beds and have sunk in several places. This is particularly the case in the servants' hall, where there is a large accumulation of deposit and water under the floor.

56. *Kitchen.*—There is a bell-trap (Fig. 24), **W** on plan, in the hearthstone under the boiler tap (see Note Q, par. 41).

FIG. 24.

Bell-trap.

57. *Scullery.*—See sink **R**, pars 41 and 42, and w.c. **N**, ars. 31 and 32.

58. *Cistern Cupboard.*—See cistern **H**.

59. *Back Area.*—There is a square built brick trap into which the rainwater pipe **E**, par. 9, from the flat dips; also a square cast-iron D-trap **X** in the centre of the area; the whole trap is loose and can be lifted by the hand.

60. *Servants' Hall.*—See sink **S**, par. 43.

61. *Wine Cellar.*—See soil-pipe **P**, par. 35.

62. *Foot of Staircase.*—See rain-water pipe **B**, par. 4.

63. *Housekeeper's Room.*—See sink **U**, par. 47. There is a bell-trap **W**, fig. 24, under the boiler tap by the hearth (See Note Q, par. 41.)

64. *Pantry.*—See sink **T**, par. 45.

65. *Front Area.*—There is a bell-trap, **Y**, fig. 18, Note Q, in the centre; also one under the tap from the old lead cistern **I**. The old brick-built dust-bin under the stairs is much broken and the bricks are in a very offensive condition.

66. *Front Cellar.*—See w.c. **O**, par. 33. The urinal in the cellar must be done away with entirely, as it will be quite unnecessary with the new w.c. There is a large brick-built catch-pit or trap **Z** formed with dip-stone across the same; it has a very large quantity of deposit at the bottom. The drain from here to the sewer is a 14 in. brick barrel drain, into which the pipe from the w.c. falls; this is on the sewer side of the trap.

Note Y.—These drains are so defective that it is quite unnecessary to test them with water; they are sealed at every point, and comment upon them is needless.

67. *Recommendations.*—Provide for the temporary removal of rain-water. Take up the stone and wood floors as necessary; clear out and cart away old drains and dig out and remove all wet or foul earth, as well as the old brick drain and catch pits. Fill in the ground with dry brick rubbish and lime and make good with brickwork in cement all openings in the walls after removal of the old drains.

Dig out the ground and form all trenches with proper fall, the highest end of the drain to be kept, if possible, 18 in. below the ground level. This trench is to be made sufficiently wide at the bottom to allow a man to walk with one foot on each side of the drain, to avoid treading upon it.

Lay, as shown on plan, between the middle and front areas, upon 6 in. of cement concrete, a 4 in. stout cast-iron drain, coated internally with Dr. Angus Smith's solution, with caulked metal water-tight joints and a regular fall of not less than 2 in. in 10 ft., but where possible the fall should be 2½ in. to 3 in. in 10 ft. Form in the front area, where shown on plan, on a 6 in. bed of concrete a proper disconnecting chamber **CC** (see illustration to Note z ii), 9 in. work in hard stock bricks in cement, 3 ft. long by 2 ft. 6 in. wide inside measure. On the bottom of this, in the line of the drain-bed, lay a taper contracted outlet channel pipe, with a fall from 4 in. to 6 in. in the 3 ft. length, in order to secure a smart flow into the syphon trap (see note zii), and at the bottom end of same provide and fix on proper cement concrete bed a syphon with a 4 in. contracted inlet and 5 in. outlet. Bed the stopper of the inspection eye with grease. (See Note z, also Note KK in Example II.) Connect the various branches from the w.c.'s and gullies, as shown, and bring them into the manhole in white-glazed curved 4 in. channels, with a sharp fall of 5 in. or 6 in. into the bottom. These branches are to be all of 4 in. London stoneware glazed drain-pipe (see note z), laid on a 6 in. concrete bed with cement water-tight joints. Each pipe should be laid upon two flat bricks, one placed just behind the collar and the other at the extreme end; this allows the hand to be passed round the pipe more easily than if laid on the ground, an advantage both when the joint is made and also in the event of a leakage. It likewise prevents the weight of the pipe squeezing out the cement when new. Make good the bottom divisions and the slopes of the chamber in brickwork, and cement the whole of the interior.

Provide a 4 in. pipe air-inlet **EE** to the manhole from the top of same and carry up in chase a galvanised iron pipe in the front area wall fitted on the top with a galvanised box and grating.

Provide and fix on the top of the disconnecting-chamber a strong, cast-iron, galvanised, lifting, air-tight frame and cover. Connect on to the outlet from the syphon trap a 5 in. to 6 in. socket, and lay a 6 in. London stoneware pipe drain with cement joints into the sewer, **the last pipe to have an inspection eye that this pipe of drain may be tested to the manhole before filling in ground.**

Note z.—5 in. drains are in more general use, but where only one 3½ in. soil-pipe exists to ventilate the drains it is better to use the 4 in. drain. A drain of this size is quite sufficient for the requirements of any house similar to the one under consideration, and it will be more in accord with the London County Council by-law which provides that the ventilating pipe shall be of equal dimensions with the drain. It is, however, of great importance in using so small a drain that all closet traps should be well ventilated. A 4 in. drain, with a fall of 1 in 65,

when running full will discharge 204 gallons per minute, much more than this drain can ever be required to do. In using iron drains it is generally found that when they rust at all it is from the outside, hence the importance of covering them with Portland cement concrete, particularly if in a damp situation.

68. *New Area.*—Provide and fix a gully **AA** and carry a 4 in. drain, as elsewhere described, to deliver into side of flushing gully in middle area. Pave this area with 2 in. York stones laid and pointed in mortar.

69. *Middle Area.*—A 12 in. fat-trap flushing gully is to be fixed by the new window, the top to be 16 in. below the level of the pavement, which is to be dished and rebated to receive an iron grid to take off the surface water. Where the fall will not admit of the gully being at this depth the top may have a cast-iron cover screwed down, or the flushing arrangement must be modified to meet the requirements. If a screw-down cover is used the gully will require a short ventilating pipe.

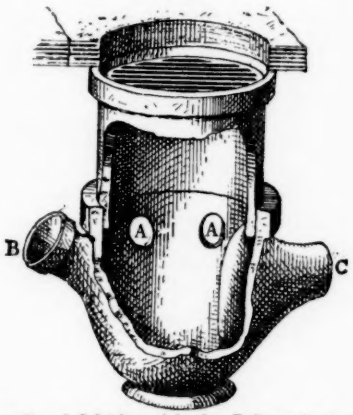
Provide and fix a gully at **X** to take waste-pipe from bath, also one to take the waste of sink **S** in servants' hall; it is perhaps scarcely necessary to have both gullies, but **X** is put for the better drainage of area. Connect this gully into the end of new chamber and connect also with the waste pipe from the scullery sink.

Note 1.—The brick-built fat-trap (Fig. 25) is now quite discarded by modern plumbers, though till within the last few years it was looked upon quite as a necessary adjunct. It was but a stepping-stone to the flushing-gully. One of the earliest things attempted was that the fat and sand from the scullery sink should not be allowed to foul the drain, and this the fat-trap accomplished effectually, but the fat-trap required regular attention—that is, some three or four times a year it had to be emptied, and the cover examined to see that it was air-tight. It was, after all, but a make-shift and a remedy but little removed from a disease. The flushing gully (Fig. 26) works automatically in connexion with a flushing tank, and our attention

FIG. 25.

Old Fat-trap.

FIG. 26.



Flushing gully.—A, Inlet from sinks, &c.; B, Connexion to flushing tank; C, Ditto to drain.

now is transferred to this latter. As these tanks at times have a habit of not fulfilling their mission, it is well to have them furnished with a plate-glass side so that their action or otherwise may be observed. As a rule they may be relied upon where the supply is from the main direct or from a cistern at a much higher level. They fail when there is want of a sufficient flush of water at the last moment to set up the action of the syphon. They are usually fitted with a reverse action ball valve—that is to say, when the ball is at the lowest point the water is shut off. The cistern is filled by means of a very small tap that can be regulated to charge it in any given time. When the cistern is nearly full the risen water lifts the ball, and the water rushes in through the valve and starts the syphon. The force of some 25 or 30 gallons of water conducted into the gully by a 2 in. or 3 in. lead pipe breaks up the fat, which has collected and hardened, and it is rolled away down the drain without trouble. It is well before fixing the apparatus to hear from any water company which particular form of apparatus meets with their approval.

Provide a 30 gallon automatic action, galvanised iron flushing tank with glass front, and fix on strong wrought-iron brackets in the kitchen about 8 ft. from the ground. This is to be supplied by a ½-in. branch pipe from the main supply to the house, fitted with a special valve, if required by the water company, or by a reversed action ball-valve. Carry down a strong 2 in. lead pipe into the back of the new flushing gully.

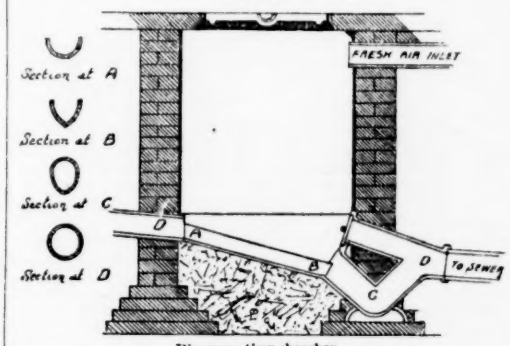
70. *Manhole* **Z.**—Build an inspection chamber, as described for front area, omitting the syphon trap and fresh-air inlet. Generally provide and fix stoneware self-cleansing gullies, and carry pipe drain branches from these and from the w.c., as before described, into the new inspection chamber, as shown on plan. It frequently happens—as in the City—that these have to be placed within doors. In this case the chambers should be fitted with patent "lever-locked," cast-iron, intercepting or inspection chambers. These have the advantage of increasing the draught through the drain, which is always somewhat impeded by the air space in the manholes; but, on the other hand, the traps must be most carefully ventilated, as the air-cushion provided by the manhole is absent. In all cases where the drains are not out of doors they should be of iron throughout, and where expense is not a matter of importance they may be left exposed in a brick trench, much in the same way as hot-water pipes are treated. After the drains have been tested with water and found sound, cover over with concrete before the earth is replaced.

Note 2 ii.—The ventilation in the drain is supposed to take place by the admission of fresh air in the short arm placed in the disconnecting chamber, which escapes through the soil- and ventilating-pipes at the extreme end of the drain. As a rule this will be the case, but where the disconnecting chamber is situated on the south side of the house the upcast pipes would be due north, in which case the natural tendency of the air currents would tend in the contrary direction. The air on the north side would be colder and heavier than that in the front, which would be warmed by the radiation from the front of the house. In such a case it is better to carry up the otherwise short inlet-pipe to the top of the house and reverse the current; the inlet would then be at the back. Of course, whenever the w.c.'s are used in either case air is drawn down the soil pipe.

All soil- and ventilating-pipes should be closed at the lowerend before connexion with the drain, and the top of each closet trap sealed that they may be filled to the top for the water test.

The section and plan of the disconnecting chamber given in Figs. 27 and 28 indicates the principal points to be observed in its construction. The syphon should have a large water seal and nothing to impede the

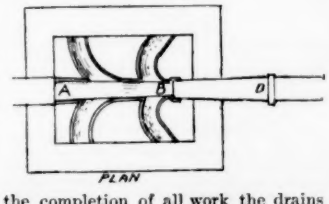
FIG. 27.



Disconnecting chamber.

flow. By the addition of a little grease with the putty used in cementing the inspection cover to the eye of the syphon the same can be readily taken out if required without fracture, or, for preference, use a piece of slate bedded in cement; this can easily be broken and replaced with a fresh piece when an inspection is desired. The extra fall allowed in the channel-pipe quickens the flow of sewage into the trap, which is also assisted by the egg-shaped outlet of the channel-pipe and the inlet to the syphon. (See par. 67.) The cement on the sides, &c., of the chamber must be thoroughly well trowelled.

FIG. 28.



71. On the completion of all work the drains and manholes should be tested with water. This can be done by sections from one manhole to another. In this final examination an electric bull's-eye lamp will be found useful, as it allows any rough internal surfaces to be seen at once. It frequently happens that when the manholes are built some

of the cement used is washed into the drain. This cakes round the joints, and unless discovered and removed will soon cause a stoppage. If a lamp connected with an accumulator is placed at the end of the drain and a small piece of looking-glass held at an angle at the other end, the whole of the interior can be distinctly seen, provided the drain is straight. In fact, a patent has been granted to the inventor of a small carriage on which such a lamp is placed, and this can be pushed round a bend by means of a jointed rod. This arrangement, with an attendant, can be hired of the patentee. After the manhole covers have been bedded down in Russian tallow the soil-pipes and drains should be finally tested by means of smoke or chemicals.

Remove the front of the old brick dustbin and thoroughly clean down the brickwork to the back and sides; point in cement, and twice lime-white. Provide a suitable portable, galvanised, wrought-iron dustbin.

Note z iii.—It is of the utmost importance to see that the drains are laid upon a proper concrete bed, as in the event of a settlement the joints are sure to break and the entire value of the work to be destroyed.

In the arrangement of a plan for the pipes there are several things to be borne in mind. It is well to keep every drain perfectly straight, so that it may be seen from end to end like a gun-barrel; but if it is necessary to have a bend it should be placed next to the inspection chamber. Again, when possible let each short drain enter the manholes separately, but avoid long lengths of dead drains without ventilation at the upper ends; rather have two branches connected than do this. In the case of w.c. **O** the drain to the manhole is 6 ft. long and unventilated, therefore we use a 6 in. pipe, as the charge from the closet will be less likely to syphon the trap than if a 4 in. pipe is used. Arrange, if possible, that each gully trap is fed from a sink, so that the water in the trap may be renewed in any weather.

It cannot be too strongly urged that the surest way of removing foul gas is to keep a current of fresh air continually in movement through the drains and soil pipes.

The size, the length, and the number of bends in a pipe all greatly affect the velocity with which air will travel through it. In the case of a rush of water down a soil-pipe the inlet or exit of the air must be as easy and free from obstruction as possible. In order to meet the sudden demand, it will certainly make its way through the point of least resistance, and in many cases this is past the agitated water of the nearest trap back into the room, or by the withdrawal of the water entirely, the trap being afterwards left unsealed. When it is remembered that the resistance to the motion of air caused by friction in a pipe is in inverse proportion to the diameter, it will be at once apparent that a small pipe is much less useful for the purposes of ventilation than a large pipe.

72. *Taps.*—The question of taps is one of considerable importance. Within the last year or so a tap has been in use that is a decided improvement upon the old ground-in taps made entirely of metal. The friction was continuously in one spot, and any grit that lodged between the metal surfaces soon caused the tap to leak. This was particularly the case in the hot-water taps. The sharp particles of carbonate of lime,—precipitated in the hot water after the heat had expelled the carbonic acid gas which held the lime in solution,—in a few weeks would cause the best ground-in taps to leak. The more modern screw-down high-pressure valves fitted with a vulcanite seating are but little better. The seating often becomes fixed if the tap is not in frequent use, and the vulcanite requires to be constantly renewed. By a simple and ingenious arrangement this is avoided, and the modern ones present a constantly varying face in the metal seating, a contrivance which is likely to result in a much longer life to the tap. In the case of all draw-off taps the patentee has been enabled to do away entirely with the packing through which the screw-down handle works; this packing is always a cause of trouble through leakage. Working on somewhat similar lines, these taps have been still further improved upon by another patentee, whose bib and self-closing valves—the latter made upon the equilibrium principle—bid fair to supersede all others at present in use.

ESTIMATE

For proposed Alterations and Sanitary Work as explained in Specification and shown on Plans. (EXAMPLE I.)

Work in connexion with the Rain-water Pipes.

	£	s.	d.
Disconnect the rain-water pipe **A** from drain (carrying off water from front gutter), cut pipe or fix new length as required, and connect with easy bend into side inlet of new gulley (drain measured elsewhere)... ... ... 6/3	0	6	3
Clear away the present rain-water pipe **B** from flat between the two roofs, and give credit for same at end of bill 6/-	0	6	0
53 ft. run, 3½ in. 8 lb. lead rain-water pipe fixed with four cast lead tacks to each length and soldered joints carried down casing at 4/4	11	9	8
24 ft. run, 4 in. Doulton's tested stoneware drain-pipe, the joints made with sand and cement laid on a bed of Portland cement concrete 6 in. thick, including digging; average depth 12 in., and covering with 6 in. of concrete, and taking up floor, relaying, and making all good at completion (this price may vary according to the condition of old floor) at per ft. 3/3	£4	10	0
Connect rain-water pipe to drain-pipe with easy bend, and brass collar with necessary joints 12/6	0	12	6
1 connexion of 4 in. drain-pipe with gully **F F**... ... ... 1/3	0	1	3
Disconnect rain-water pipe **C** from soil pipe (carrying off water from back of house), cut pipe or put new length as required, and make same to discharge on flat over study 12/6	0	12	6
Disconnect rain-water pipe **E** from drain (carrying off water from flat over study), fit shoe and make same to discharge over new gully (the removal of the portion used as soil-pipe is taken in) 12/6	0	12	6

Work in Connexion with Cisterns.

For forming dormer enclosure in roof to hold cisterns, as shown on plan and described in specification	25	0	0
Remove 150 gallon lead-lined cistern **F** with its connexions and refix same in altered position in new dormer enclosure, and properly seal off all old connexions ... 25/-	1	5	0
1 ft. 6 in. run, 1½ in. lead overflow carried through wall into external gutter on flat 1/3	0	2	6
1 1½ in. lead joint to pipe passing through cheek of lead lined dormer 2/10	0	2	10
45 ft run, 1½ in. stout lead service pipe from cistern to second floor, with all necessary bends, &c. 1/9	3	18	9
1 hole in cistern and lead joint 4/4	0	4	4
1 1½ in. screw-down stopcock and soldered joint, fitted with brass union at each end 35/-	1	15	0
16 ft. run, 9 in. by 1 in. deal wrought and beaded casing and backings, with brass cups and screws, and painting (four oils) 1/5	1	2	8
Fit about 8 ft. super. of ¾ in. matched boarded ledged cover and 1 in. frame to cistern, the flap to be hung with cross garnet, and painting same (four oils) 15/6	0	15	6
Remove the old slate cistern **G** and its connexions and give credit for same at end of bill 12/6	0	12	6
Provide and fix a 500 gallon galvanised iron cistern ½ in. plate and allow for hoisting and fixing in new dormer enclosure 40 ft. above ground floor level 175/-	8	15	0
92 ft. run, 1¼ in. lead pipe from cistern to kitchen in basement with all necessary bends, and carried down alongside old hot-water pipes 1/5	6	10	4
1 in. branch from pipe to cylinder, about 10 ft. long, with sharp bend in same and make necessary connexion 25/-	1	5	0
5 ft. run, encase pipes with hair felt, passing through water-closet, secured with copper wire ... ... -/6	0	2	6
1 1½ in. brass union, hole drilled in cistern and joints ... 8/3	0	8	3
1 1¼ in. screw down stopcock and brass union and joints at each end 26/3	1	6	3
5 ft. run, 1½ in. lead overflow from cistern carried through wall into external gutter on flat 1/8	0	8	4
1 1½ in. brass union and hole drilled in cistern and joints 9/4	0	9	4
1 1¼ in. solder joint to pipe passing through cheek of lead-lined dormer 2/10	0	2	10
40 ft. run, take down present pipe casing, and refix same with brass cups and screws ... ... -/4	0	13	4
7 ft. 6 in. run, 1 in. deal wrought and beaded casing on third floor fixed with brass cups and screws and paint (four oils) 1/6	0	11	3
12 ft. run, ¾ in. lead supply to housemaid's sink... ... 1/1	0	13	0
2 ¾ in. soldered branch joints 1/10	0	3	8
1 ¾ in. screw-down bibcock, of good make, to housemaid's sink and joint 10/-	0	10	0
Remove the lead-lined cistern **H** in cupboard under ground floor, and give credit for same at end of bill... ... 6/3	0	6	3
Fix 100-gallon galvanised iron cistern ½ in. plate and fix same in position in new larder on strong fir bearers cut and pinned into wall... ... ... 81/-	4	1	0
6 ft. run, 1 in. lead supply from cistern in larder to scullery sink 1/3	0	7	6
1 1 in. brass union hole drilled in cistern and joint ... 6/10	0	6	10
1 1 in. screw-down bibcock of good make and joints ... 12/6	0	12	6
1 ft. 6 in. run, 1 in. lead overflow carried through external wall into area 1/2	0	1	9
1 1 in. brass union hole drilled in cistern joint 6/10	0	6	10
Remove the old cast lead cistern **I** at end of front area, and give credit at end of bill 12/6	0	12	6
Provide and fix 50-gallon galvanised iron cistern in same position as the old, but at higher level, fixed on strong fir bearers cut and pinned into wall 50/-	2	10	0
Case the above with felt and ¾ in. matched boarding with lid on top for access to cistern 30/-	1	10	0
107 ft. run, ¾ in. lead main supply and fixing with wall hooks and all necessary joints 1/1	5	15	11
49 ft. run, ¾ in. ditto branches to cisterns... ... ... 1/1	2	13	1
1 ¾ screw-down stopcock with joint and brass union at each end 13/9	0	13	9
4 ¾ equilibrium ball valves, joints and fixing 10/-	2	0	0
4 ¾ brass unions, hole-drilled in cistern and joints ... 5/-	1	0	0
4 branch joints 1/10	0	7	4
59 ft. run, encase all pipes exposed in roof with felt secured with copper wire ... ... -/6	1	9	6

Work in Connexion with Water-closets.

Clear away the closet **J** on third floor and make good all work disturbed 17/-	0	17	0
Form new water-closet with stud partition, plastered both sides, fitted with doors, lining complete, and for cutting opening through external wall forming new window opening, all as shown on plan	18	10	0
1 qr. 20 lb., 4 lb. lead safe under closet 22/6	0	9	9
3 ft. run, labour dressing over fillet, including copper nailing ... ... -/4	0	1	0
3 ft. run, 1½ ft. 1 in. deal fillet ... ... -/2	0	0	6
2 ft. run, 1½ in. lead waste-pipe from safe carried through external wall 1/4	0	2	8

1 in. copper flap and soldering	1/6	£0	1 6
1 1½ in. soldered joint, lead pipe to safe	2/6	0	2 6
Provide and fix in position a combination pedestal closet with earthenware slop top, white basin with flushing rim, supported on lead cone, with hinged seat and brackets complete	110/-	5	10 0
1 galvanised 3 gallon syphon silent water waste preventer, with brackets, chain, and pull	43/6	2	3 6
5 ft. run, 1½ in. lead flush pipe from water waste preventer to closet, including joint and fixing with cast lead tacks soldered to pipe at	1/10	0	9 2
2 ft. run, ½ in. lead supply to water waste preventer ...	-/9	0	1 6
2 ½ in. soldered joints at	1/7	0	3 2
1 ½ in. screw-down stopcock, joint and brass union at each end	8/9	0	8 9
2 ft. 6 in. run, ¾ in. lead overflow from water waste preventer carried through external wall	1/1	0	2 9
1 8 lb. lead P. trap and joint to hopper	18/9	0	18 9
1 short branch of 3½ in. 10 lb. lead bent pipe 2 ft. 6 in. long, carried through external wall and soldered at one end to lead trap and the other to soil pipe	25/-	1	5 0
Form new closet **K** over well of staircase, with stairs and landing to reach same, with opening cut in external wall, and new sash and frame fixed therein, all as described in specification and shown on plan ..	540/-	27	0 0
32 ft. super. take up flooring and put sound boarding and lime and hair pugging	-/8	1	1 4
3½ yds. super, provide and lay tile floor prime cost value 12/- per yard, and include for Portland cement floated surface	21/-	3	13 6
21 yds. super, prepare and render walls in cement, provide and fix white glazed tiles, in Portland cement, prime cost value 10/- per yard	19/-	19	19 0
Provide and fix a valve closet with 1¼ in. valve, with separate supply to overflow and fix same in position, as shown on plan, and 1½ in. ventilation pipe and brass union to valve-box	120/-	6	0 0
3 ft. run, 1½ in. lead ventilating pipe from valve-box carried through external wall	1/8	0	5 0
1 1½ in. soldered lead joint	2/10	0	2 10
2 ft. run, 1½ in. lead flush pipe to w.c., taken from 1½ in. down service, and cast lead tacks soldered to pipe ...	1/10	0	3 8
2 1½ in. lead soldered joints	2/6	0	5 0
1 1½ in. screw-down stopcock and soldered joint, both ends with unions (as above)	26/-	1	6 0
1 3½ in. 8 lb. lead trap with soldered joint and fixing to closet	16/-	0	16 0
Short branch of 3½ in. 10 lb. lead bent pipe, about 4 ft. 6 in. long, with soldered joint at one end to trap and at the other to soil pipe	34/-	1	14 0
Adapt and alter (or supply new) seat and riser as may be required to suit new valve closet, and make same moveable by hanging on hinges for easy access to apparatus	25/-	1	5 0
2 qr. 16 lb. 6 lb. lead safe under closet	22/6	0	14 3
3 ft. 6 in. run, 1½ in. lead waste from safe carried through external wall	1/4	0	4 8
1 1 in. copper flap and soldering an end of pipe	1/6	0	1 6
1 1½ in. soldered joint to tap	2/6	0	2 6
Paint three coats with oxide of zinc paint, the whole of wood and plaster work under seat	7/6	0	7 6
Remove the old w.c. and its connexions, and make good all work disturbed	20/-	1	0 0
Remove the old Bramah w.c. **L** next bedroom, and make good all work disturbed (this closet will now not be required)	20/-	1	0 0
Remove the old closet **M** on ground floor with its connexion, make good all work disturbed	20/-	1	0 0
Form new w.c., with partition, door, sash, and frame, all as described in specification and shown on plan ...		12	10 0
15 ft. super. Take up flooring, lay sound boarding, and lime and hair pugging...	1/-	0	15 0
1½ yds. super, provide and lay tile floor, prime cost value 12/- per yard, and include for Portland cement floated surface	21/-	1	16 9
Provide and fix a pedestal closet with 8 lb. lead syphon trap, with mahogany flap and paper box, and fix in position	120/-	6	0 0
1 short branch of 3½ in. 10 lb. lead bent pipe, about 2 ft. long, connected at one end with brass thimble-piece and soldered at other end to soil-pipe	27/6	1	7 6
1 3 gall. syphon silent water-waste preventer, with bracket, plated chain, and pull	50/-	2	10 0
6 ft. run, 1½ in. lead flush pipe from water-waste preventer to closet, and fixing with cast lead tacks soldered to pipe	1/10	0	11 0
2 1½ in. soldered joints	2/6	0	5 0
29 ft. run, 1 in. lead pipe from second-floor landing to basement, with all necessary joints, wall hooks, and fixing	1/3	1	16 3
22 ft. run, 1 in. wrought and beaded casing, fixed with brass cup and screws, and painting same (four oils) ...	1/4	1	9 4
4 ft. run, ½ in. lead supply to water-waste preventer ...	-/9	0	3 0
1 ft. 6 in. run, ¾ in. lead overflow to water-waste preventer	1/1	0	1 8
2 ¾ in. soldered joints	1/7	0	3 2
1 ¾ in. soldered joints	1/9	0	1 9
Remove sink **R** and closet **N**, cutting away lead flat over to form open area lined with white glazed tiles; cut doorway into kitchen, build walls to form new larder and scullery; all as described in specification and shown on plan		80	0 0
Provide and fix new w.c., marked **N** on plan, in basement, a pedestal closet with flushing rim basin properly fixed, the closet to have deal hinge flap to lift up	40/-	2	0 0
25 ft. of 2 in. lead anti-syphonage pipe into that of w.c., marked **M**	2/6	3	2 6
1 2 in. brass sleeve piece	2/6	0	2 6
2 2 in. soldered joints...	3/4	0	6 8
1 3 gallon syphon flushing water-waste preventer, with brackets, chain, and pull	37/6	£1	17 6
5 ft. run, 1¼ in. lead flush pipe from water-waste preventer to closet, and tacks and soldering	1/10	0	9 2
2 soldered joints to above	2/6	0	5 0
8 ft. run, ½ in. lead supply to water-waste preventer ...	-/9	0	6 0
2 ft. run, ¾ in. lead overflow to ditto	1/1	0	2 2
2 ½ in. soldered joints	1/7	0	3 2
1 ¾ in. soldered joints	1/9	0	1 9
1 ½ in. screw-down stopcock and unions, soldered joints both ends	10/-	0	10 0
Form half-brick enclosure under vault for new w.c. marked **O** on plan, with door fitted in same, all as described ...		5	0 0
Provide and fix a basin with flushing rim, all as described, to closet marked **N**	40/-	2	0 0
1 3 gallon syphon flushing water-waste preventer, with bracket, chain, and pull...	37/6	1	17 6
5 ft. run, 1¼ in. lead flush-pipe from waste water-pipe to closet and cast tacks	1/10	0	9 2
2 soldered joints to above	2/6	0	5 0
11 ft. run, ½ in. lead supply to water-waste preventer...	-/9	0	8 3
2 ft. run, ¾ in. lead overflow	1/1	0	2 2
2 ¾ in. joints	1/7	0	3 2
1 ¾ in. joint	1/9	0	1 9
Provide and fix 25 gallon galvanised iron cistern **I**, fixed on strong bearers, under front steps, and enclose cistern with wood lining and pack with felt...	40/-	2	0 0
2 ft. 6 in. run, ¾ in. lead supply	1/1	0	2 8
2 ft. run, ¾ in. lead overflow	1/1	0	2 2
2 ¾ brass unions and hole drilled in cistern and joints	5/-	0	10 0
1 ¾ in. soldered branch joint	1/9	0	1 9
55 ft. run, 3½ in. 10 lb. lead soil-pipe **BB** fixed at back of house, with all necessary joints and cast lead tacks, soldered to pipe, carried up as high as parapet ...	5/4	14	13 4
(NOTE.—This price varies somewhat, according to position of the work.)			
14 ft. run, 3½ in. 10 lb. lead soil-pipe, but fixed to slating of roof, and encased with 1 in. deal casing	6/-	4	4 0
Extra labour to 3½ in. bend	5/-	0	5 0
Connect soil-pipe to iron drain, with easy bend and brass thimble and soldered joint	12/6	0	12 6
1 3½ in. copper wire balloon fixed on top of soil-pipe...	3/-	0	3 0
49 ft. run, 2 in. lead anti-syphonage pipe carried alongside soil-pipe, with all necessary joints, and cast lead tacks soldered to pipe	2/6	6	2 6
6 2 in. branch soldered joints	3/4	1	0 0
Remove the old soil-pipe, make good, and give credit at end of bill...	12/6	0	12 6

Work in connexion with Sinks.

Clear away the small lead-lined sink **Q** under stairs of second-floor landing and give credit at end of bill	5/-	0	5 0
Provide and fix a fireclay enamelled sink **Q**, fixed on strong bracket in housemaid's closet, 42 by 22 by 10 in. ...	60/-	3	0 0
47 ft. run, 1½ in. strong lead waste carried down casing by side of rain-water pipe **B**	1/9	4	2 3
1 1½ in. lead syphon trap, with cleaning cap and screw joints...	8/9	0	8 9
24 ft. run, 2 in. strong iron pipe carried under floor of pantry, taken through external wall into gully on 6 in. concrete, the joint of pipe to be caulked with lead, make good flooring and all works disturbed ...	2/6	3	0 0
Connect waste of sink to iron pipe with brass thimble and soldered joint	9/3	0	9 3
9 ft. run, 1½ in. lead pipe taken up from upper end of waste pipe, pass same through flat	1/8	0	15 0
2 1½ in. soldered joints to pipe and lead flat	2/10	0	5 8
1 1½ in. copper wire balloon fixed to top of pipe ...	2/-	0	2 0
4 ft. 6 in. run, 1½ in. lead anti-syphonage pipe connected with lead ventilating pipe	1/8	0	7 6
5 ft. ¾ in. stout lead service	-/9		3 9
1 ¾ in. high pressure bibcock	4/10		4 10
2 ¾ in. soldered joints	1/7		3 2
2 1½ in. soldered joints...	2/10	0	5 8
3 qr. 11 lb. 7 lb. lead, and laying on floor of housemaid's sink	22/6	0	19 0
21 ft. run, close copper nailing	-/3	0	5 3
Clear away old stone scullery sink **R** with water connexion and give credit	5/-	0	5 0
(NOTE.—The hot-water supply *will* remain.)			
Form alteration in scullery to enclose sink with new window, &c.		6	0 0
Provide and fix a glazed earthenware sink, 48 in. by 24 in. by 6 in., fixed on half brick bearer and render with Portland cement...	68/-	3	8 0
5 ft. run, 2 in. lead waste from scullery sink carried through external wall to discharge over gully	2/6	0	12 6
1 2 in. lead syphon trap, with cleaning cap, and screw with soldered joints to pipe and trap	11/3	0	11 3
1 1½ in. anti-syphonage carried through external wall, and copper wire fixed on end of pipe, about 18 in. long	4/-	0	4 0
1 1½ in. soldered joint...	2/6	0	2 6
1 1 in. screw-down approved pattern bibcock and joint to lead pipe	12/-	0	12 0
1 1 in. screw-down approved pattern bibcock, and joint to iron pipe	11/-	0	11 0
Provide and fix a draining board, covered pewter and fixed under plate rack, 2 ft. by 1 ft. 6 in.	31/-	1	11 0
Remove the old lead-lined sink **S** in servants' hall with its connexions, and give credit	5/-	0	5 0
Provide and fix deep glazed stoneware sink, fixed on strong fir framed bearers	43/6	2	3 6
3 ft. 9 in. run, 1½ in. lead waste to sink, carried through external wall into gully	1/8	0	6 3
1 1½ in. lead syphon trap, with cleansing cap and screw, with joint to lead pipe and trap		0	8 6
1 1½ in. anti-syphonage carried through external wall, and copper wire fixed on end of pipe, about 2 ft. ...	3/-	0	3 0
1 1½ in. soldered joint	2/6	0	2 6
1 1½ in. brass washer plug and waste, and soldered joint	8/6	0	8 6

31 ft. run, ¾ in. lead pipe taken from 1¼ in. down service joints 1/1	£1 13	7
1 ¾ in. branch joints 1/9	0 1	9
1 ¾ in. screw-down high pressure horizontal bibcock (approved pattern), and joint to lead pipe 9/3	0 9	3
1 ¾ in. screw-down high pressure horizontal bibcock (approved pattern), but joint to iron pipe 8/9	0 8	9
1 ¼ in. lead pipe, about 1 ft. 6 in., to housemaid's closet from rising main; 1 ¼ in. screw-down high pressure bib cock 10/6	0 10	6
Remove old lead-lined sink **T** in pantry, make all good, and give credit for old materials at end of bill 5/-	0 5	0
Provide and fix 1 in. deal wrought sink (with division in centre) 3 ft. by 1 ft. 6 in. by 1 ft., bottom and sides to be framed and dovetailed together, and division housed to back and front and fix in position 25/-	1 5	0
Milled lead in lining and flashings to sinks 25/-	1 5	0
8 ft. run soldered seam 1/6	0 12	0
11 ft. close copper nailing ... ... -/3	0 2	9
8 ft. run 1¼ in. lead waste to sinks, carried through external wall into gully 1/4	0 10	8
2 1½ in. lead syphon traps, with cleansing cap "screw," joints to lead pipe, and trap 8/9	0 17	6
1¼ in. lead anti-syphonage to above, carried through external wall, with copper wire fixed to two ends of pipe, about 5 ft. 6 in.	0 10	0
2 1½ in. soldered joints 2/6	0 5	0
2 1½ in. brass washer plugs and waste and soldered joint 8/6	0 17	0
54 ft. run ¾ in. lead pipe taken from 1¼ in. down service joints and fixing 1/1	2 18	6
2 ¾ in. branch joints 1/9	0 3	6
2 ¾ in. screw-down high-pressure horizontal bibcock (approved pattern), joint to lead pipe 8/9	0 17	6
Provide and fix draining board fixed under bottle rack, and line same with pewter, 2 ft. by 1 ft. 6 in. 31/-	1 11	0
Removal of lead sink **U** in housekeeper's room, make good and give credit 5/-	0 5	0
Provide and fix a small enamelled fireclay sink to cost 25/- fixed on proper tin-framed and wrought bearers 40/-	2 0	0
4 ft. run 1¼ in. lead waste to sink, carried through external wall to discharge over gully 1/4	0 5	4
1 1½ lead syphon trap, with cleansing cap and screw, and joint to pipe and trap 8/9	0 8	9
1¼ in. lead anti-syphonage pipe carried through wall, with copper wire fixed on end of pipe, about 3 ft. ... 5/-	0 5	0
1 1¼ in. soldered joint 2/6	0 2	6
1 2½ in. brass grating and soldering to sink 3/-	0 3	0
18 ft. run, ¾ in. lead pipe as supply to sink 1/1	0 17	4
1 ¾ in. branch joint 1/9	0 1	9
1 ¾ in. screw-down high-pressure horizontal bibcock (approved pattern) and joint to lead pipe 8/9	0 8	9

Work to Bath.

Cut away ceiling and flat over bath-room and provide new skylight, cutting away part of box-room floor, and forming partitions with ventilating shaft, all as described in specification...	22 10	0
Remove the old bath **V** and its connexions and make good, and give credit at end of bill (except bath casing and lead safe) 25/-	1 5	0
Provide and fix a first quality cast iron enamelled bath 5 ft. 6 in. long 130/-	6 10	0
Allow for repairing and refixing lead safe to bath ... 9/-	0 9	0
22 ft. run, 1¼ in. lead overflow, carried under floor of back bed-room through external wall, including taking up, relaying flooring, and notching joists, if necessary 1/7	1 14	10
1 1¼ in. soldered joint 2/6	0 2	6
1 1½ in. copper flap, and soldering to end of pipe ... 1/9	0 1	9
40 ft. run, 1¼ in. lead waste to bath, joint and fixing with cast tacks 1/10	3 13	4
Encase waste with asbestos 3/-	1 10	0
21 ft. run, 2 in. cast-iron drain pipe laid on 6 in. Portland cement concrete, joints caulked with lead, including digging average depth of 12 in., taking up flooring, relaying, and making all good 2/9	2 17	9
1 connection with 1¼ in. lead pipe to 2 in. cast-iron drain pipes, and include for brass thimble and caulked metal joint and one end soldered joint at other 8/6	0 8	6
Provide and fix an improved copper waste with trap, and connect to bath 55/-	2 15	0
36 ft. run 1¼ in. lead ventilating pipe carried up in corner of air shaft and taken through flat 5 ft. above same 1/4	1 14	8
1 1¼ in. soldered joint 2/6	0 2	6
1 hole through lead flat, and soldering pipe to same 3/6	0 3	6
1 1¼ in. copper wire balloon and fixing on end of pipe 2/-	0 2	0
8 ft. run 1 in. lead supply to bath, including taking up flooring and relaying and matching joint if necessary 1/9	0 14	0
2 1 in. soldered joints 2/-	0 4	0
Provide and fix 1 in. plated overhanging screw-down taps to bath of approved pattern and fixing complete ... 23/-	2 6	0
Adapt and alter mahogany bath top and enclosure, make part of front to shift readily for easy access to fittings, &c. 45/-	2 5	0

Work in connexion with Hot Water.

Disconnect present hot-water pipes from kitchen boiler, and make good, and work in connexion 30/-	1 10	0
Provide and fix on strong iron bracket **H** a 50 gallon strong galvanised iron circulating cylinder 150/-	7 10	0
50 ft. run 1¼ in. steam pipe flow and return from boiler to cylinder &c.... ... ... 2/3	3 7	6
2 drillings in boiler and connexions 6/-	0 12	0
Drill hole in boiler, connect a short piece of pipe, fitted with a dead weight safety valve 32/-	1 12	0
2 connexions to cylinder 5/6	0 11	0
Provide and fix 1 in. gun metal stopcock, with square head and spanner, fixed above trap of cold water supply, and carry small branch of 1 in. pipe from cylinder, and fix a similar bibcock as draw off, with nozzle on end for fixing hose pipe 45/-	£2 5	0
Connect up old 1 in. flow and return pipes to cylinder, with all necessary connexions 30/-	1 10	0
Encase hot-water cylinder with asbestos and leave inspection plate free 43/-	2 3	0
Fixing T-piece and elbow into main flow where it leaves cylinder to carry safety-valve, and provide and fix a dead weight 17/6	0 17	6
Remove old hot-water tank **AA** from bath room and make good to old connexion 12/6	0 12	6
22 ft. run, 1 in. steam pipe flow and return; take up to third-floor for supply to housemaid's sink 1/6	1 13	0
11 ft. run, 1 in. steam exhaust pipe carried up into roof and turned over into cistern in new dormer 1/6	0 16	6
Connecting of old hot-water pipe to new, say	0 5	0
8 ft. run, 1 in. steam supply pipe to bath, with all necessary connexions, including taking up flooring, relaying, and notching joists, as necessary 2/3	0 18	0
75 ft. run, ¾ in. do. as supply to housemaid's pantry and sinks 1/2	4 7	6
14 ft. run, take up floor, notch joists ... ... -/6	0 7	0
2 1 in. screw-down stopcocks fixed to hot and cold supplies under bath, with joints both ends 13/-	1 6	0
3 ¾ in. screw-down bibcocks (approved pattern) and connect to housemaid's sink and double sink in pantry ... 9/3	1 7	9
90 ft. run case hot-water pipes with asbestos where passing down casing alongside of other pipes ... ... -/7	2 12	6

Drains.

Provide for the carrying off of rain water during the temporary removal of drains 2/6	1 0	0
592 ft. sup., take up stone paving, lay aside for re-use, and relay at completion and make good any deficiency with new, both for old and new drain ... ... -/6	14 16	0
(NOTE.—This item will vary according to the character of the old stone floor.)		
148 ft. super. take up wood flooring and joists, cut same as may be necessary for the removal of old drains, and relay at completion and make all good ... ... -/7	4 6	4
193 ft. run, dig, basket out, and cart away all old drains, together with wet and contaminated earth, and fill in all voids with lime and dry brick rubbish 1/9	16 17	9
Allow for removing any cesspool, catch pits, &c., that may be found, and fill in with lime and dry brick rubbish as before... ... ... 50/-	2 10	0
Seal off old connexion with main drain in cement ... 5/-	0 5	0
51 ft. run, 4 in. strong cast-iron drain pipe coated with Dr. Angus Smith's solution, the joints caulked with lead laid on 6 in. Portland cement concrete, including digging, average depth 3 ft., filling in and ramming, remainder basketed and carted away 4/6	11 9	6
(NOTE.—This price will vary according to the nature of the ground and the amount of strutting required.)		
8 ft. run, 4 in. tested glazed stoneware pipes, the joints made with cement and sand, including laying on 6 in. of Portland cement concrete and covering with 6 in. of Portland cement concrete after drains are tested, including digging 2 ft. 6 in. deep, filling in and ramming, remainder basketed and carted away ... 3/9	1 10	0
4 ft. run, 6 in. tested glazed stoneware pipe, all as last, but digging 4 ft. deep 4/6	0 18	0
9 ft. run, 6 in. ditto, but deep digging, including any necessary planking and strutting from chamber to front vault 7/6	3 7	5
43 ft. run, 4 in. Doulton's tested pipes, all as first described, digging, average depth 2 ft. 6 in., and do. do. 3/9	8 1	3
2 extra only for 4 in. to 6 in. taper pipes 1/3	0 2	6
7 extra to 4 in. bends 1/3	0 8	9
2 extra to 6 in. bends 1/9	0 3	6
3 cut holes through 9 in. wall for 6 in. pipes and form arched eyes 4/-	0 12	0
2 ditto 14 in. ditto 6/3	0 12	6
1 ditto 22½ in. ditto 8/9	0 8	9
Give notice to vestry and pay fees for connecting new drain to main sewer 100/-	5 0	0
Provide and fix a 12 in. fat-trap flushing gully, with stone frame dished and rebated for iron cover 43/-	2 3	0
32 ft. super. 2½ in. York paving, laid and pointed in mortar, to back area 2/-	3 4	0
Provide and fix a 40 gallon automatic action galvanised iron flushing tank, with glass front, fixed on strong iron bracket, with ball valve, complete 126/-	6 6	0
9 ft. run, 2 in. lead flush pipe from flushing tank, soldered joint at one end and connected to flushing gully at the other 2/9	1 4	9
1 extra to bend 3/-	0 3	0
13 ft. run, ½ in. lead supply to flushing tank encased with felt, and secure with copper wire 1/2	0 15	2
2 ½ in. soldered joint 1/7	0 3	2
8 4 in. stoneware self-cleansing gullies set on concrete and connected to drain, gullies to have galvanised iron grids 8/9	3 10	0
Remove old brick dustbin, point and limewhite brickwork, and provide portable galvanised wrought iron dustbin 37/-	1 17	0

Inspection Chambers.

Form two inspection chambers as described in specification, one in front area 3 ft. by 2 ft. 6 in. by 4 ft. deep, inside measurement, and one to middle area 3 ft. by 2 ft. by 2 ft. 6 in. deep, all as detail given below.		
6½ yards cube, excavate, basket out, and cart away surplus earth 7/6	2 7	6
5½ yards super. 6 in. Portland cement foundation ... 2/6	0 13	9
89 ft. super., one brick wall in cement 1/3	5 11	3
21 ft. run, labour, materials, corbelling over to receive air-tight covers... ... ... 1/-	1 1	0
10 yards super., render walls in Portland cement ... 3/-	1 10	0

2. form sloping benches in cement, and prepare concrete bottom to receive half channel pipes... ... ... 10/-	£1	0	0
6 ft. run, 4 in. contracted outlet, white glazed channel pipe set in cement 2/6	0	15	0
8 4 in. white glazed channel curves 5/-	2	0	0
Provide and fix on proper cement concrete bed a syphon, with a 4 in. contracted inlet and 5 in. outlet, and connect on to outlet a 5 in. to 6 in. socket 25/-	1	5	0
Allow for bedding stopper of inspection eye in grease 1/6	0	1	6
6 ft. run, 4 in. galvanised iron pipe at air inlet, including chase in brickwork rendered in cement, and short length of 4 in. drain-pipe and easy bend connected to inspection chamber 3/6	1	1	0
1 4 in. galvanised iron inlet valve and fixing on end of pipe 12/-	0	12	0
4 eyes formed in 1 brick wall for 4 in. iron pipe to pass through 3/-	0	12	0
8 ditto 4 in. stoneware ditto 3/-	1	4	0
4 connexions of white glazed channel to 4 in. iron drain-pipe 1/-	0	4	0
8 connexions of white glazed bend to 4 in. earthenware drain-pipe 1/-	0	8	0
2 approved galvanised air-tight covers and frames and fixing complete 65/-	6	10	0
Allow for cutting away for and making good in all trades after all trades on the whole of the foregoing work not herein specified 400/-	20	0	0
	£638	3	10
Credit value of old materials	20	0	0
	£618	3	10

THE TERRACE HOUSE.

REPORT AND SUGGESTIONS ON EXAMPLE II.

73. *The Roof.*—This is principally of slate, with a lead flat over the staircase.

74. *Rain-water Pipe* **A** is of cast iron and 4 in. in diameter. It takes the water from the front gutter and is disconnected over a gully in the front area.

75. *Rain-water Pipe* **B** is also a 4 in. cast-iron pipe, and takes the bulk of the water. It passes on to the lead flat over the cistern and then down in a casing, where it delivers over a gully in the cupboard in the basement by the servants' hall.

Note AA.—The position of this gully in the cupboard is very undesirable. It is out of sight, and therefore not likely to be recharged, excepting in wet weather.

76. *Recommendation.*—This pipe had better be brought down on to the lead flat over the bath-room. In order to do this reverse the lead gutter on the flat over the cistern and fix about 8 ft. of 3½ in. galvanised cast-iron rain-water pipe, with head and shoe.

77. *Rain-water Pipe* **C**.—This is a similar pipe to **B**, but 2½ in. in diameter, and takes the water from the flat over the bath-room down on to the flat over the housekeeper's room.

78. *Recommendation.*—As this pipe will now have to take a much larger quantity of water than formerly, it must be changed for a galvanised cast-iron pipe 3½ in. diameter, with head and shoe (about 27 ft. run of pipe).

79. *Rain-water Pipe* **D** is a 4 in. cast-iron pipe and delivers the water from the flat over the housekeeper's room and larder into a disconnected gully in the back area.

80. *Recommendation.*—After removal of gully this pipe is connected with new drain to act as a ventilation to same. This drain delivers over gully **U** in middle area.

81. *Cistern* **E**.—This is a wood, lead-lined cistern, its inside measure being about 7 ft. by 3 ft. by 3 ft. 6 in. deep, and will hold about 400 gallons. It supplies everything, both hot and cold water, with the exception of the butler's pantry sink **O**, the sinks in the servants' hall **P** and the housekeeper's room **Q**, also the w.c. marked **J** on plan. It does this by means of a 1¼ in. lead pipe carried down in the corner of the w.c.'s with branches to the several sinks. There is a trumpet-mouthed standing waste in this cistern, which is connected into the iron rain-water pipe **B** from the flat over.

82. *Recommendation.*—Construct a window 2 ft. by 1 ft. 6 in. in the external wall, fitted with louvres and wood shutters to light and ventilate the cisterns, and enclose the open end, after the removal of the w.c. partition, with double doors and frame up to the ceiling; divide the cistern, so that one side will hold about 150 gallons and the other about 240, with a wood partition made good with 6 lb. lead on one side, to be called "Cistern **E**." Supply a wrought-iron galvanised cistern as large as possible, and fix in the other compartment thus made after the removal of the old lead lining, which cistern will be called "Cistern **E**¹." Take out the old waste and make good to the bottom of the cistern after. Provide and fix two separate 1½ in. overflows from these cisterns, carried to deliver on to the flat over the bathroom; make good the existing down service into cistern **E**, and fix in same, immediately under the cistern, an inch screw-down high-pressure stopcock. This cistern will now supply the w.c.'s **G**, **H**, **I**, and **J** only. Provide a wooden lid to the cistern. The partition at the side of the w.c. **G** will be taken down and a fresh one constructed, as shown on amended plan, in order to break the connexion between the cistern enclosure and the w.c. (See Note G in first example.)

Reform w.c. **G** as shown on plan with new partition &c. The sides of this w.c. partition are to be plastered down to the floor on each before the skirting is fixed.

83. *Cistern* **E**¹.—Drill for, and connect with brass union, a 1¼ in. lead down service to the level of the basement ceiling, carry across the well of the staircase and down the casing to a point over the foot of the kitchen staircase. Provide and fix in same, under the cistern, a 1¼ in. screw-down high-pressure stopcock, and provide a wooden lid.

84. *Cistern* **F**.—In the butler's room in the basement there is a zinc-lined wooden cistern in the cupboard to hold about 60 gallons. The waste from this empties over the top of the butler's sink. It supplies the sinks **O**, **P**, and **Q**, and w.c. **J**.

Note BB.—The first objection to this cistern is that it serves both the sinks and the w.c. (though this last is cut off by a flushing cistern). Another objection is that it is situated in a room used as a bedroom by the butler. This is very undesirable, both on account of those who have to drink water that has stood for many hours in such a position, and for the sake of the occupant of the room. The moisture in the air caused by evaporation from such a considerable surface of cold water in a warm room must certainly be detrimental to health.

The waste-pipe placed over the sink is another mistake. In the event of an overflow the chances are either that the plug would be in the sink, or that a sponge or tea leaves would be drawn into the outlet from the sink and prevent the escape of the waste water from the cistern, which would then flood the room.

85. *Recommendations.*—Remove this cistern, now no longer required. Provide and fix on brackets in w.c. **K**, in the front area, a shallow galvanised wrought-iron cistern, to hold 20 gallons, fixed close up to the ceiling, with a trapdoor in the roof of the w.c., under the iron staircase for access to same, and bring a 1¼ in. overflow pipe through the wall into the area.

86. *Main Supply.*—Remove the present large lead service pipes to the several cisterns, and carry up to one of the top cisterns a ¾ in. lead pipe, which, to be in order with the regulations of the water company, must not be of a less weight than 9 lb. per lineal yard. Fix in same in the scullery, near the point at which this main supply enters the premises, a ¾ in. high-pressure screw-down gun-metal stopcock. Carry a branch to the second top cistern, and one each to the flushing tank in the basement passage and w.c. cistern in the front area. Provide and fit to each branch a ¾ in. equilibrium ball valve. Cover the cistern that is to supply the w.c. in area, and also the exposed service pipes with hair felt, and enclose in wood case.

87. *Water-closet* **G**.—This closet is too near the cistern cupboard. It must be detached by an alteration in the position of the partition, as shown on the amended plan. (See par. 82.) The closet itself is one with a back wash-out, supplied by a disconnecting syphon cistern. It has a lead safe with a disconnected waste. There is a defect in the joint that connects the closet with the branch of the soil-pipe. (See note L in first example.)

Note CC.—This closet has a glazed-ware P trap with flanged end and is bolted to a flanged lead out-go by means of an iron collar; the lead out-go is soldered to the soil-pipe. The strain of the bolts has broken the earthenware flange and caused the joint to become defective. There is also a provisional socket, A, on the outlet of the earthenware trap for an anti-syphonage pipe. (See illustration, par. 96.) This hole has been stopped up with a bung and white lead, which has become dry and loose, and this allows bad air from the soil-pipe to enter the house.

88. *Recommendations.*—A small hopper basin closet with flushing rim should be fixed here, fitted with an earthenware slop top, as described in recommendations for w.c. **J** in first plan, with supply from the old service, and trap and branch into the external soil-pipe, as there described.

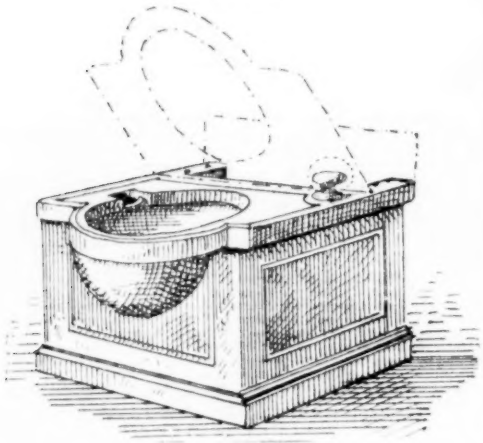
89. Water-closet **H** is a valve closet of an inferior make, with a cast-iron valve box and overflow into the wrong side of same. (See note I in first example). The handle has not a parallel action. There is a lead safe under, with the overflow carried through the external wall. A cast-lead syphon trap is fixed under the closet, with a branch from same into the soil-pipe. It is supplied with water from cistern **E**.

90. *Recommendations.*—Use here an enclosed white earthenware pedestal valve closet. The one shown (Fig. 29) meets

all the requirements of a valve closet, and the earthenware enclosure has the advantage of being readily accessible. Line the walls and the floor with tiles. For details see w.c.'s **J** and **K**, first example.

91. *Water-closet* **I.**—On the ground floor there is a side outlet closet with a weighted rubber-lined plunger attached to the handle and a supply valve under the seat. There is

FIG. 29.



no safe under. The trap of the closet is cracked and will not hold water.

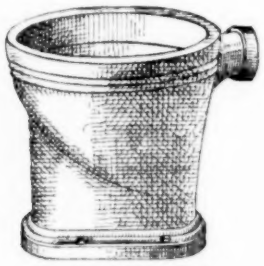
Note DD.—This closet is open to the same objections as all wash-out closets with the basin and trap in one piece of ware. (See note L in first example). In the case of this closet the evil of the side outlet is more pronounced, as the flush through the valve is less than that from a syphon cistern which is generally used, and the plunger also breaks the force of the water into the trap.

The crack in the trap is to be attributed to frost. The leakage from the trap was soon discovered in this case, as the water showed through the ceiling below. Had the closet been fixed on the ground-floor of a house some time might have elapsed before the escape of water would have been seen; meanwhile the bad air in the drain would have had free access to the house.

92. *Recommendation.*—Fix a similar closet here to the one described in par. 30, with a supply branch from the old down service, and the trap and branch to the external soil-pipe to be in all respects similar.

93. *Closet* **J** *(in basement).*—This is a wash-down pedestal one, with an S-trap under the centre of the square bottom (Fig. 30). When tested with a smoke rocket placed in

FIG. 30.



Wash-out Pedestal Closet.

the gully in the area this connexion was found to be defective. It is flushed by a galvanised wrought-iron two-gallon cistern, not syphonic.

Note EE.—This closet is a good one if the outlet of the trap stands clear of, and not under, the closet. (Figs. 30 and 31.) It is most difficult, and therefore risky, to make a joint between the trap and the drain with the outlet of the trap situated as this one is. The flushing tank only acts while the handle is held down, and the flush is quite inadequate.

94. *Recommendations.*—Use a closet as described for closet **N**, par. 32. Supply and fix at the back of the closet, 6 ft. 6 in. from the floor, a three gallon syphon silent-flushing cistern of cast iron, painted or galvanised, and connect a 1¼ in. down service from the same to the arm of the basin. See detail w.c. **N.**

95. *Water-closet* **K.**—This is a circular, stoneware, white-glazed, front-outlet closet with an independent S-trap under. The S-trap is fitted with an outlet for an anti-syphonage pipe, (see A. Fig. 31), which outlet is stopped with a cork and white lead. There is a two gallon flushing syphon-action cistern, which cistern is supplied from **E**. The closet is dirty, and there is a great inclination for the contents to hang in the basin. It has an enclosed fixed wood seat and riser.

96. *Recommendations.*—Provide a pedestal closet with flushing-rim basin and trap as described for closet **N**, par. 32, or a closet as illustrated (Fig. 31), but see that the

FIG. 31.

joint to drain is at the back, above the floor line, where it can be easily made. The closet is made, and should be used without the provision for the anti-syphonage-pipe at A. This is shown here to illustrate Notes CC and EE, but it is undesirable, as it would seem impossible to make a permanent joint between earthenware and lead. The old cistern may be used again, and fix a new deal hinged seat on brackets and cement the wall under same.

97. *Soil-pipe.*—This is a 4 in. seamed lead pipe carried down inside the closets, where it enters the drain from the bottom closet; a 2 in. lead ventilator is continued up to about 2 ft. above the roof parapet wall. When a pailful of water was thrown down closet **G** the water in the trap of closet **H** was syphoned out below the seal. The effect on **G** was also to reduce the water in the trap, but did not break the seal. The construction of the other closets prevented any observation of the traps.

Note FF.—The soil-pipe is insufficiently ventilated, and the connexion with the drain is made without the intervention of a brass thimble. (See Pars. 5 and 36 and Note o in first example.)

98. *Recommendations.*—After the removal of the old soil-pipe &c., fix in the external angle of the wall a 3½ in. drawn-lead soil-pipe, weight 10 lb. to the foot run, fixed with three pairs of stout cast-lead tacks to each 10 ft. length of pipe, properly nailed to the walls. Continue this pipe about 5 ft. above the top of the parapet wall, finished on the top with a perforated lead cap with copper wire-guard. Connect the branch soil-pipes from these upper closets and provide and solder on the bottom of the soil-pipe a strong brass thimble or sleeve piece for connexion with the iron branch of the drain. (See Pars. 5 and 36.) Drill a hole in the iron branch drain that connects the bottom closet to the manhole; tap and screw into same a 2 in. brass union as near to the trap of the closet as possible. Take care that this union is not allowed to enter below the top of the drain, or if the socket A is retained to w.c. **J** (see Fig. 31) connect the anti-syphonage to same by a brass sleeve piece. Carry up from this union a 2 in. strong lead anti-syphonage pipe with branches from the traps of the other three closets. Connect the upper end of this pipe into the soil-pipe some 3 ft. above the branch from the top closet. (See anti-syphonage pipe in Par. 37 and following note o.)

99. *Sink* **L** *(on Third Floor).*—This is a lead-lined sink with syphon trap under and a 1¼ in. waste down into the drain at the foot of the kitchen stairs. There is a hot and cold supply.

Note GG.—This is an exposed and untidy place for a housemaid's sink. The waste pipe connexion direct with the drain is an additional and unnecessary opportunity for the introduction of bad air into the house; in this case it is aggravated by the branch connexion from sink **M**, the trap of which is liable to syphonage when **L** is in use, as this waste pipe is without any ventilation.

100. *Recommendations.*—Remove the sink, waste, and services, and make good all works disturbed.

101. *Sink* **M**.—This is a lead-lined sink with a syphon trap under and a waste branched into the waste pipe of sink **L**. It has a hot and cold supply.

Note HH.—This sink is in its present position devoid of ventilation, enclosed as it is under the staircase, and a more suitable position must be found for it.

102. *Recommendations.*—Fix either a wood-framed or a lath-and-plaster partition in the bath-room, as shown on plan, to enclose the new sink-room; cut away the lead flat over and put in new skylight, properly flashed &c., to light this room.

103. Remove the old lead-lined sink **M**, waste, and hot and cold-water service, and make good after. Provide and fix an enamelled fireclay sink in the new sink-room with 1½ in. stout lead waste, fitted with drawn-lead syphon trap (see Fig. 36), with brass inspection cap. Immediately under the sink connect a 1¼ in. anti-syphonage pipe on the out-go of the trap, carry through the external wall, and connect into the ventilating pipe of the waste, about 3 ft. up above the entrance of same. Continue the waste down to the middle area and connect by means of a brass sleeve piece directly into disconnected drain, delivering into gully **U**. Carry up this 1¼ in. waste to 2 ft. above the parapet, to act as a ventilating pipe, and fit the end with double copper wires.

Carry a ¾ in. branch of lead pipe from the down service of cold-water cistern **E**[1] (see Pars. 82 and 83), and fix a ¾ in. screw-down bibcock to supply sink; connect a ¾ in. branch from the hot-water flow-pipe to the bath, fitted with a similar bibcock. Carry a short ½ in. branch from rising main to supply this sink and provide and fix a ½ in. screw-down high-pressure bibcock. (See par. 123.)

Line the floor with 7 lb. lead, copper-nailed.

104. *Sink* **N** (*Scullery*).—This is a stone sink with 1½ in. waste into a brick-built fat-trap (See Note zi, first example) in the area. A drawn-lead syphon-trap is fixed under the sink and fitted with a screw-cap for inspection. The cold supply is from cistern **E**, and the hot from the hot-water system to the bath. (See Note Q in first example.)

105. *Recommendations.*—Remove the old stone sink and provide and fix in place of same a suitable stoneware glazed sink. Fix under the same a 2 in. drawn-lead syphon trap, with screw cap, and carry a strong lead 2-in. waste through the wall into the new flushing gully **BB** in the area. (See par. 69 and following note.) Connect a 1¼ in. anti-syphonage pipe on the out-go of the trap, and carry through the outer wall, finished fair with the face and fitted with a + copper wire guard in the end.

106. Provide and fix in the passage, outside the scullery, on strong iron brackets a 30 gallon galvanised wrought-iron automatic flushing tank **AA**; carry a stout 2 in. lead pipe to discharge into the flushing gully **BB**, and supply the tank by a ½ in. strong service from the main, fitted with a reverse action ball valve. Provide and fix a draining board at side of sink, covered with lead or pewter.

Continue a ¾ in. branch from the down service of Cistern **E**[1] (see Pars. 82 and 83) in a lead pipe and fix to this and to the hot-water supply a screw-down high-pressure bibcock. Fix the stud partition **GG** with the door across the passage in order to keep back the smell of the scullery and kitchen.

107. *Sink* **O** (*butler's*).—This is a lead-lined, double sink with traps under and waste disconnected into the gully **X** in the area, and with hot and cold supply.

108. *Recommendations.*—Re-line the sinks with 6 lb. lead sides and 8 lb. bottoms and reconnect old wastes, but lengthen the end of same to deliver into the gully **X** in the altered position, and carry from the out-go of each trap a 1½ in. ventilating pipe through the wall into the area. Connect a ¾ in. lead branch pipe into the service to sinks **P** and **Q** from the main supply from cistern **E**[1] (see Pars. 82 and 83) and fix horizontal, screw-down, high-pressure bibcocks to serve the sink. Provide and fix similar cocks for hot water, fix 1¼ in. brass washers and plugs and provide and fix draining boards as before. (See Note S in first example.)

109. A slate filter stands near this sink, with a separate supply from cistern **F**, and a service from the filter is fitted with a tap over the sink. All table-water is drawn from this tap.

Recommendation.—Remove and clear away connections.

Note II.—Upon microscopic examination of this water it was found to contain living organisms. A neglected filter is infinitely worse than none at all. It only contaminates the water with accumulated filth.

110. *Sink* **P** (*Servants' Hall*).—This is a lead-lined sink with a 1 in. waste pipe into the gully **T** in the area, fitted with a drawn-lead syphon trap and supplied with hot and cold water, the latter from cistern **F**.

111. *Recommendations.*—Re-line the sink with 6 lb. lead sides and a 8 lb. bottom. Carry a 1½ in. strong lead waste-pipe into the new gully **T** in the area, fitted with trap and air-pipe, as before described. Continue from the bottom of the down service from cistern **E**[1] an inch lead pipe on the ceiling line as far as this sink, with a short ¾ in. branch to supply same, fitted with screw-down tap, as to **O**, also for hot-water service, and with a new 2½ in. brass grate in the bottom.

112. *Sink* **Q** (*Housekeeper's Room*).—This is a lead-lined sink with disconnected waste into the external gully **S**, not trapped, and with hot and cold supplies as the last one, (See Note T in first example.)

113. *Recommendations.*—Fix a fireclay enamelled sink in place of the lead one with 1¼ in. lead waste properly trapped (see sink **O**) and carried into the external gully **S** in the back area. Continue the ¾ in. service from **P** and fit hot and cold taps, as before described.

114. *Bath* **R** *and Hot Water System.*—There is an old painted zinc bath enclosed in mahogany casing, with top; also a plug and chain waste, which is carried through the external wall and delivers over a rain-water head inserted in the pipe that takes the water from the flat over. A lead safe under the bath has an overflow pipe carried through the external wall.

The hot and cold supplies are delivered over the foot of the bath by bibcocks, the cold supply from cistern **E**.

The hot-water cistern is fixed on the floor in the cupboard under cistern **E**; the expansion pipe is turned over this cistern and is fed by means of a small supply cistern fixed at the side of same, with a trapped service into the return pipe to the kitchen boiler, the 1 in. flow and return pipes from which are carried up the same casing as the rain-water pipe **B**.

There is no safety-valve to the kitchen boiler.

Note JJ.—The waste into the rain-water head is a mistake. The soapy water from the bath will corrode the long gutter on the flat over the housekeeper's room, and cause annoyance by the smell which is sure to arise. The cold supply pipe has been brought over the top of the safe in such a way that the leaky valve has allowed the water to tail back down the pipe and fall outside the safe instead of into it, thereby doing much damage to the school-room ceiling.

115. *Recommendations.*—Provide and fix a 5 ft. 6 in. cast-iron, white-enamelled, parallel bath, with a running 1½ in. lead trap under same, fitted with brass inspection-cap and screw. Connect to bath with brass-plated grate and union, the grate to be fitted with a vulcanite plug and brass chain. Carry a 1½ in. lead waste from out-go of trap into waste from sink **M**, and an anti-syphonage pipe into the ventilating pipe from same. Provide a plated brass grate and brass union as overflow to bath, and carry a 1½ in. short lead pipe through outer wall, fitted at end with a copper draught check. Repair and refix the lead safe and carry a 1¼ in. overflow through the wall as before. (See also Par. 51.)

Connect the present cold-water service into the new down service from cistern **E**[1] and provide two proper plated, screw-down bath taps, and fix on hot and cold supplies. Alter the cold service under the bath tap so that any leakage will fall into the safe. The cocks to be over-hanging, plated ones, as described in par. 51. Adapt mahogany casing and refix same.

Remove the small supply-cistern at the side of the closed hot-water tank and stop off connexions.

Provide and fix, on strong iron brackets at the side of the kitchen, a 56 gallon galvanised iron hot-water cylinder **FF** (see illustration, par. 53) with 1½ in. flow and return pipes from same to the boiler. Disconnect the pipes from the old boiler and connect to top and bottom of the cylinder. Connect a 1 in. branch lead pipe from the service to the scullery; form a deep trap in same and connect into the return pipe from the cylinder into the boiler. Provide and fix in same a square-headed, screw-down stopcock and spanner (the key of which should be kept by some responsible person), also a square-headed, draw-off bibcock, with a ¾ in. lead pipe carried over gully **A** in front area, for emptying the cylinder. Provide and fix, on top of the boiler, a 1 in. dead-weight safety valve. This to be fixed on end of 1¼ in. pipe carried through chimney breast to kitchen (see par. 53). Enclose the cylinder with asbestos.

116. *The Drains.*—The drains have been comparatively recently and carefully laid, but several errors have been committed, both in arrangement and execution, that have nullified their utility. Both are 6 in. glazed earthenware pipe drains, not town-made. There is a well-built disconnecting chamber **AA** in the scullery with a hinged iron cover, but with a broken lock.

117. *Front Area.*—There is a main branch from the w.c. **K** to the disconnecting chamber, with branches from the rain-water pipe **A** and the centre gully **Y**, also from the fat-trap **Z** (see Par. zi., first example). There is an inlet air ventilator to the chamber, the talc valve to which has one hinge broken and is partially stopped by dead flies and dust.

An inspection chamber **W** by the door to the servants' hall collects the several branches, as shown on plan. It was found impossible to fill them with water.

Note KK.—The first objection to this plan is that there is so little ventilation to the drain; the 2 in. pipe carried up from the top of the soil pipe is quite insufficient when the diameter of the drains is considered. (See Note zii. in first example.)

Another great objection is the position of the two chambers inside the house. Other weak points are (1) the position of the gully in the cupboard (see Par. 75 and Note aa); (2) the two long lengths of unventilated drain laid under the servants' hall and housekeeper's room; (3) the direct connexion of the sink waste at the foot of the stairs with the main drain (this should have been brought out to the nearest area and made to deliver over a gully). So much for the objections to the plan; now for the defects in execution. The use of earthenware in place of town-made stoneware pipes should not be resorted to on account of economy without the exercise of great care in the selection of each individual pipe. Earthenware pipes are made of some one local clay, few of which will stand the heat necessary to thoroughly vitrify them without distortion of the pipe; nor are they so smooth as the town-made ones. These last are compounded of mixed clays, generally broken burnt clays mixed together; they are capable of standing a great heat and receive a high glaze. It is of considerable importance to select pipes of good shape, as unless this is done it is impossible to lay a drain with equal fall and an even bottom. The advantage of a high glaze is obvious.

The drains, though laid on concrete, are not filled in all round with the same, and the result of this omission would be that each pipe could only rest directly on the collar. The other end would bear upon the collar of its neighbour, with an inclination to squeeze the new cement in the joint out at the bottom and allow the inner edge of the next pipe to stand up in front of it. This would not only render the bottom of the drain uneven and check the flow of the water, but when the earth was thrown into the trench and rammed many of these joints would be broken.

118. *Recommendations.*—Build a disconnecting chamber **Z** in the front area, as shown on plan and described in report of Example No. 1, par. 67, and Note zii.

Build an inspection chamber **W** in the middle area, as before described.

The main drain from chamber to chamber should be laid with 4 in. heavy cast-iron pipe, treated internally with Dr. Angus Smith's solution, and also the length of drain from soil-pipe to manhole, so that the soil-pipe may be easily tested at any future time by inserting a drain-stopper.

The drains from back area are to be 4 in. stoneware pipe drains laid as before described, and are to be disconnected to deliver into a gully **U** in middle area. This drain will be ventilated by the rain-water pipe **D** from lead flat over housekeeper's room which does not deliver over a gully but is directly connected. Par. 80.

Remove the old brick-built dustbin and point and lime-white behind same. Provide a portable galvanised wrought-iron bin.

Note LL.—Should a larger main drain be used than 4 in., the following should be done. Build a small inspection chamber in back area, and carry a 5 in. iron drain from this into chamber in middle area. Disconnect rain-water pipe and bath wastes over gullies, and carry up a 4 in. ventilating pipe to some 3 ft. above lead flat over bath-room, either in 8 lb. lead soil-pipe or in stout galvanised iron with leaded caulked joints.

ESTIMATE

For proposed Alterations and Sanitary Work as explained in Specification and shown on Plans. (EXAMPLE II.)

Work in connexion with the Rain-water Pipes.

	£	s.	d.
Forming opening for new outlet **B**, dress lead so as to deliver over rain water head, and provide any new lead that may be required; remove old pipe and make good 25/-	1	5	0
8 ft. run, 3½ in. galvanised cast iron rain-water pipe, and fixing from outlet to flat over bath-room 1/4	0	10	8
1 3½ in. head 3/6	0	3	6
1 3½ in. shoe 1/10	0	1	10
27 ft. run, 3½ in. galvanised cast iron pipe **C**, from flat, over bath-room to flat over housekeeper's room... ... 1/4	1	16	0
1 3½ in. head 3/6	0	3	6
1 3½ in. shoe 1/10	0	1	10
Remove old rain-water pipe and make good 12/6	0	12	6
Connect rain-water pipe **D** to drain with short length of pipe 6/-	0	6	0

Work in connexion with Cisterns.

Cut opening through 9 in. wall 2 ft. by 1 ft. 6 in., make good jamb and provide and fix in same a framed louvre light and shutters 40/-	2	0	0
Take down partition and clear away 5/-	0	5	0
57 ft. super. 1½ in. deal square framing as enclosure to cistern room 1/6	4	5	6
No. 2 extra, to forming and hanging doors in same, hung with butts and fitted with proper fastenings ... 7/6	0	15	0
10 ft. 6 in. super., 1½ in. deal division to cistern, housed to present sides 1/6	£0	15	9
Remove old lead lining cistern **E** from one compartment and make good and give credit 6/6	0	6	6
2 qr. 10 lb. 6 lb. lead lining to division 25/-	0	14	9
6 ft. run, soldered seam 1/6	0	9	0
3 ft. 6 in. run, close copper nailing... ... ... -/3	0	0	10
Supply and fix in other compartment of cistern **E** a 240 gallon galvanised iron cistern **E**[1] 156/-	7	16	0
6 ft. run, 1½ in. lead overflow to both cisterns 1/8	0	10	0
2 1½ in. brass unions and joint 8/9	0	17	6
2 holes in lead-lined cistern and galvanised cistern ... 1/6	0	3	0
Make good the existing down service 12/6	0	12	6
1 1 in. screw-down high-pressure stopcock with unions and soldered joints both ends 18/6	0	18	6
1 ¾ in. deal ledged cistern-cover and frame, hung with and including 1 pair cross garnets, and paint same four oils 17/6	0	17	6
Remove partition to w.c. **G** third floor and clear away 5/-	0	5	0
59 ft. super., stud partition to form new w.c., lath and plaster flat and set both sides 1/1	3	3	11
16 ft. 6 in. super., 1¼ in. square framed door, with linings complete, and paint 4 oils 2/2	1	15	9
1 proper w.c. catch and furniture... ... ... 3/6	0	3	6
1 4 in. brass barrel bolt 1/6	0	1	6
1 pair 4 in. butt screw and hanging 1/6	0	1	6
5 ft. run, deal skirting to match existing 1/-	0	5	0
55 ft. 1¼ in. lead service from cistern **E**[1] to basement ceiling 1/5	3	17	11
1 1½ in. brass union hole drilled in cistern and joint... 8/3	0	8	3
1 1½ in. screw-down high-pressure stopcock, with union and soldered joints both ends 26/0	1	6	0
1 ¾ in. deal ledged cistern cover and frame, hung with and including 1 pair cross gannell and paint 4 oils ... 17/6	0	17	6
Remove the cistern **F** in butler's pantry and make good 5/-	0	5	0
Provide and fix in w.c. **K** 20 gallon galvanised iron cistern fixed on strong brackets... ... ... 32/-	1	12	0
1 trim for and provide and fix small trap door in roof of w.c. for access to cistern 20/-	1	0	0
2 ft. run, 1¼ in. lead overflow to cistern 1/4	0	2	8
1 1½ in. brass union hole drilled in cistern and joint... 8/3	0	8	3
Remove the present large lead service pipes, make good, and give credit at end of bill... ... ... 25/-	1	5	0
93 ft. run, ¾ in. lead main supply to cistern 1/1	5	6	2
37 ft. run, ¾ in. branches to cistern **S** 1/1	2	0	1
1 ¾ in. screw-down stopcock, with union and joints both ends 13/9	0	13	9
3 ¾ in. equilibrium ball valves 8/9	1	6	3
3 ¾ in. brass union holes drilled in cistern and joints... 5/9	0	17	3
4 ¾ in. branch joints 1/9	0	7	0
44 ft. run, take down deal casing and refix with brass cups and screws ... ... -/6	1	2	0
32 ft. run, encase supply pipes passing from scullery to cistern in front area with felt secured with copper wire ... -/6	0	16	0

Work in connexion with Water-closets.

Clear away the closet **G** on third floor and make good all work disturbed 17/-	0	17	0
1 4 lb lead safe under closet, about ½ cwt. 12/-	0	12	0
3 ft. run, labor dressing over fillet, including copper nailing ... ... -/4	0	1	0
3 ft. run, 1½ in. by in. deal fillet ... ... -/2	0	0	6
1 ft. 6 in. run, 1 in. lead waste pipe from safe, carried through external wall 1/2	0	1	9
1 1 in. copper flap and soldering 1/6	0	1	6
1 1 in. soldered joint lead pipe to safe 2/-	0	2	0
Provide and fix in position a short hopper with flushing rim and slop top supported on pedestals with 8 lb. lead syphon trap, and including hinged seat and brackets complete 90/-	4	10	0
1 galvanised 3 gallon syphon silent water waste preventer, with brackets, pull, and chain 37/6	1	17	6
5 ft. run, 1¼ in. lead flush pipe from water-waste preventer to closet, including joint and fixing with cast lead tacks soldered to pipe 1/5	0	7	1
2 soldered joints 2/6	0	5	0
2 ft. run, ¾ in. lead supply to water-waste preventer ... -/9	0	1	6
2 ¾ in. soldered joints 1/7	0	3	2
1 ¾ in. soldered joints 1/9	0	1	9
1 ½ in. screw-down stopcock, with unions and joint both ends 9/6	0	9	6
1 ft. 9 in. run, ¾ in. lead overflow from water-waste preventer carried through external wall 1/1	0	1	11
1 lead **P** trap and joint to hopper... ... ... 16/-	0	16	0
Fix branch of 3½ in. 10 lb. lead bent pipe 11 ft. long, carried through external wall and soldered at one end to lead trap and the other to soil pipe 55/-	2	15	0
Clear away old closet **H** on second floor and make good all work disturbed 20/-	1	0	0
21 ft. super., take up flooring, put sound boarding, and lime and hair pugging, as taken in Estimate I. to w.c. **K** -/8	0	14	0
2½ yards super., provide and lay tile floor, P.C., 12/- per yard, and include for Portland cement floated surface... 21/-	2	9	0
17½ yards super., prepare, match, and mend in cement, provide and fix white glazed tiles, P.C., 10/- per yard, as taken in Estimate I., to w.c. **K**... ... ... 19/-	16	17	3
Provide and fix a pedestal valve closet, flushing rim basin and table top in earthenware, also with earthenware valve box and enclosure to closet 1½ in. valve copper regulator, mahogany seat in position as shown on plan, with 1½ in. ventilation pipe 270/-	13	10	0
3 ft. run, 1½ in. lead ventilating pipe from valve-box carried through external wall 1/8	0	5	0
1 1½ in. soldered lead joint 2/10	0	2	10
8 ft. 6 in. run, 1¼ in. lead flush pipe to w.c. 1/4	0	11	4
2 1½ in. joints 2/6	0	5	0
1 1½ in. screw-down stopcock and soldered joints and union at each end 26/-	1	6	0
1 3½ in. lead **P** trap, with soldered joint and fixing to closet 16/-	0	16	0

1 short branch of 3½ in. 10 lb. lead bent pipe, about 2 ft. 6 in. long, with soldered joint at one end to trap, at the other to soil pipe 25/-	£1	5 0
Allow for lead safe under valve closet 10/-	0	10 0
3 ft. 6 in. run, 1½ in. lead waste from safe carried through external wall 1/4	0	4 8
1 1 in. copper flap soldering 1/6	0	1 6
1 1¼ in. soldered joint to safe 2/6	0	2 6
Remove the old closet **I** on ground floor, and make good all work disturbed. 20/-	1	0 0
14 ft. run, take up flooring, lay sound boarding, lime and hair plugging 9/8	0	9 4
1¾ yds. Provide and lay tile floor p.c. 12/- per yard, and include for Portland cement floated surface ... 21/-	1	16 9
Provide and fix a pedestal closet with 8 lb. lead syphon trap, white basin, mahogany flap, paper box complete 120/-	6	0 0
1 short branch of 3½ in. 10 lb. lead bent pipe, about 40 in. long, connected at one end with brass thimble-piece and soldered at other end to soil pipe 40/-	2	0 0
1 3 gallon syphon silent water-waste preventer, with bracket and plated chain and pull 50/-	2	10 0
6 ft. run, 1¼ in. lead flush pipe from water-waste preventer to closet and fixing with cast lead tacks 1/10	0	11 0
2 soldered joints to pipe 2/6	0	5 0
5 ft. run, ¾ in. lead supply to water-waste preventer ... -/9	0	3 9
1 ft. 6 in. run, ¾ in. lead overflow 1/1	0	1 8
2 ¼ in. soldered branch joints 1/7	0	3 2
1 ¾ in. soldered branch joint... ... ... 1/9	0	1 9
Remove the old wash-down closet **J** and make good 12/6	0	12 6
Provide and fix a pedestal closet with flushing rim properly fixed, refix the old deal hinged flap ... 40/-	2	0 0
1 3 gallon syphon flushing water-waste preventer, with brackets, chain, and pull 37/6	1	17 6
5 ft. run, 1¼ in. lead flush pipe from water-waste preventer to closet, with cast tacks soldered to lead pipe ... 1/10	0	9 2
2 soldered joints to do. 2/6	0	5 0
5 ft. run, ¾ in. lead supply to water-waste preventer ... /9	0	3 9
1 ft. 6 in. run, ¾ in. lead overflow 1/1	0	1 8
2 ¼ in. soldered joints 1/7	0	3 2
1 ¾ in. soldered joint 1/9	0	1 9
Remove the old closet **K** in front area, and make good 12/6	0	12 6
Provide and fix a pedestal closet with flushing rim and properly fixed, refix deal seat and riser, but hinge seat 40/-	2	0 0
Refix the old water-waste preventer 3/6	0	3 6
5 ft. run, 1¼ in. lead flush pipe from water-waste preventer to closet with cast tacks soldered to lead pipe... ... 1/10	0	9 2
2 soldered joints 2/6	0	5 0
1 ft. 6 in. run, ¾ in. lead overflow 1/1	0	1 8
7 ft. run, ¾ in. lead supply from cistern to water-waste preventer ... ... /9	0	5 3
2 ¼ in. soldered joints... ... ... 1/7	0	3 2
1 ¾ in. soldered joint 1/9	0	1 9
1 ¼ in. brass union hole drilled in cistern and joint ... 5/6	0	5 6
Remove the whole of soil-pipe at back, make good, and give credit at end of bill 12/6	0	12 6
60 ft. run, 3½ in. 10 lb. lead soil pipe fixed at back of house, with all necessary joints, and cast lead tacks soldered to pipe, carried up 5 ft. above parapet 5/4	16	0 0
Connect soil-pipe to iron drain **V** with easy bend and brass thimble and soldered joint 12/6	0	12 6
1 3½ in. copper wire balloon fixed on top of soil-pipe... 3/-	0	3 0
Drill hole in iron branch, drain and fix a 2 in. brass union with joint to lead pipe 15/-	0	15 0
62 ft. run, 2 in. lead anti-syphonage pipe carried up alongside soil-pipe, with all necessary joints, and cast tacks, soldered to pipe 2/6	7	15 0
7 2 in. branch soldered joints 3/4	1	3 4

Work in connexion with Sinks.

Remove the sink **L** on third floor under staircase and make all good and give credit 10/-	0	10 0
80 ft. super., stud partition **M**, lath, plaster, float, and set, both sides to form new enclosure to sink in bath-room 1/1	4	6 8
19 ft. super., 1⅞ in. moulded (both sides) door, with linings and architraves complete 2/2	2	1 2
1 pair 4 in. butts, screws and fixing 1/6	0	1 6
1 6 in. mortice lock and brass furniture 8/-	0	8 0
Take down present door &c. to bath-room and refix in new partition complete, and make all good 7/6	0	7 6
23 ft. run, plaster moulded cornice to match that in bath-room 2/3	2	11 9
17 ft. run, deal moulded mitred skirting to match existing 1/-	0	17 0
Allow for cutting away lead flat over, trim for and fix 2 in. skylight, with curb, properly flashed, and glaze with ¼ in. Hartley's rolled glass, and make good all work disturbed 2 ft. 6 in. by 2 ft. 80/-	4	0 0
Remove old lead lined sink, with its connexions, and make good and give credit at end of bill for old materials 10/-	0	10 0
Provide and fix a fireclay enamelled sink, fixed on strong brackets, 36 in. by 22 in. by 10 in. 60/-	3	0 0
42 ft. run, 1½ in. strong lead waste, carried through external wall and down to middle area, to discharge into side inlet of gully 1/9	3	13 6
20 ft. run, 1½ in. strong lead pipe to ditto, carried up as ventilating pipe 2 ft. above parapet 1/9	1	15 0
1 1½ in. lead syphon trap, with cleansing cup and screw and joint to pipe 10/-	0	10 0
4 ft. 6 in. run, 1½ in. lead anti-syphonage pipe, fixed on outgo of trap and carried through external wall... 1/8	0	7 6
1 hole through lead flat, with soldered joint to pipe passing through 5/-	0	5 0
4 1½ in. soldered joints 2/10	0	11 4
1 1½ in. copper wire balloon and fixing 2/0	0	2 0
21 ft. run, ¾ in. lead supply 1/1	1	2 9
2 ¾ in. branch joints 1/9	0	3 6
14 ft. run, ¾ in. steam-pipe as hot supply, with connexion from bath and sink 1/2	0	16 4
25 ft. ½ in. stout lead service ... ... -/9	0	18 9
1 ½ in. high-pressure screw-down bibcock 4/10	£0	4 10
2 ½ in. soldered joints 1/7	0	3 2
32 ft. run, take up flooring and relay and notch joists if necessary ... ... -/6	0	16 0
2 ¾ in. screw-down bibcocks, hot and cold (approved pattern), and joints 9/3	0	18 6
3 qr. 3 lb. 7 lb. lead and laying on floor 22/6	0	17 5
21 ft. run, close copper nailing ... ... -/3	0	5 3
Remove the old stone sink **N** in scullery, and make good 5/-	0	5 0
Provide and fix a glazed earthenware sink 48 in. by 24 in. by 6 in., fixed on half-brick bearers and rendered with Portland cement 70/-	3	10 0
3 ft. run, 2 in. lead waste carried through external wall to discharge into flushing gully 2/6	0	7 6
1 2 in. lead syphon trap with cleansing cap and screw with soldered joint to pipe and trap 12/6	0	12 6
1 1½ in. anti-syphonage pipe carried through external wall and copper wire fixed on end of pipe, about 1 ft. 6 in. 3/6	0	3 6
1 1½ in. soldered joint 2/6	0	2 6
Provide and fix a 40 gallon automatic action galvanised iron flushing tank **AA** with glass front, fixed on strong iron brackets, with ball valve complete 126/-	6	6 0
16 ft. run, 2 in. lead flush pipe from flushing tank soldered at one end and continued underground and connected to flushing gully at the other end 2/9	2	4 0
1 extra to bend 3/-	0	3 0
2 ft. run, ¾ in. lead supply to flushing tank ... ... -/9	0	1 6
2 ¼ in. soldered joints 1/7	0	3 2
38 ft. run, ¾ in. lead supply to scullery sink 1/1	2	1 2
1 ¾ in. branch joint 1/9	0	1 9
1 ¾ in. screw-down high-pressure bibcock (approved pattern), and joint to lead pipe 9/3	0	9 3
1 ¾ in. screw-down do., and joint to iron pipe 9/3	0	9 3
Provide and fix draining board covered with pewter, fixed under plate rack, 2 ft. by 1 ft. 6 in. 31/-	1	11 0
26 ft. super., stud partition **GG**, lath, plaster, float, and set both sides across passage as shown on plan ... 1/1	1	8 2
19 ft. super., 1¼ in. square framed door with linings complete, and paint 4 oils 2/2	2	1 2
1 pair 4 in. butts, screws, and fixing 1/6	0	1 6
1 6 in. rim lock and brass furniture 5/6	0	5 6
5 ft. run, 1 in. deal square skirting, paint four oils ... -/8	0	3 4
Allow for stripping lead from old sink **O** in butler's pantry, and give credit 3/-	0	3 0
1 cwt. 8 lb. milled lead in re-lining sink in butler's pantry 25/-	1	6 9
8 ft. run, soldered seam 1/6	0	12 0
11 ft. run, close copper nailing ... ... -/3	0	2 9
5 ft. run, 1½ in. lead waste connected to old waste and taken into side inlet of gully 1/4	0	6 8
2 1½ in. soldered joints... ... ... 2/6	0	5 0
1 1½ in. lead anti-syphonage pipe carried through external wall, with copper wire fixed on end of pipe ... 10/-	0	10 0
2 1½ in. soldered joints 2/6	0	5 0
2 1¼ in. brass washers, plug and waste, and soldered joint 8/6	0	17 0
40 ft. run, 1 in. lead pipe taken from 1¼ in. down service carried along ceiling as far as sink to servants' hall to supply three sinks 1/3	2	10 0
1 1 in. soldered joint 2/-	0	2 0
2 extra to bends in 1 in. lead pipe 1/-	0	2 0
17 ft. run, ¾ in. lead supply to butler's sink taken from 1 in. branch 1/1	0	18 5
1 ¾ in. soldered joint 1/9	0	1 9
2 ¾ in. screw-down, high-pressure, horizontal bibcocks (approved pattern), and joints to lead pipe... ... 9/3	0	18 6
2 ¾ in. do., do., and joints to iron pipe 9/3	0	18 6
Provide and fix draining board fixed under bottle rack and line same with pewter, 2 ft. by 1 ft. 6 in. 31/-	1	11 0
Remove filter and make good work disturbed 5/-	0	5 0
Allow for stripping lead from old sink **P** in servants' hall and give credit at end of bill, size 2 ft. 6 in. by 1 ft. 6 in. by 1 ft. 3/-	0	3 0
3 qr. 2 lb. milled lead in re-lining sink 25/-	0	19 3
4 ft. run, soldered seam 1/6	0	6 0
8 ft. run, close copper nailing ... ... -/3	0	2 0
7 ft. run, 1½ in. strong lead waste pipe carried through external wall into gully 1/9	0	12 3
1 1½ in. lead syphon trap, with cleansing cap and screw and joint to pipe and trap 10/-	0	10 0
1 1½ in. lead anti-syphonage pipe carried through wall, with copper wire fixed on end of pipe 7/6	0	7 6
1 1¼ in. soldered joint 2/2	0	2 2
1 2½ in brass grating and soldering to sink 3/-	0	3 0
12 ft. run, ¾ in. lead pipe as supply to sink 1/1	0	13 0
1 ¾ in. branch joint 1/9	0	1 9
1 ¾ in. screw-down high-pressure horizontal bibcock (approved pattern), and joint to lead pipe 9/3	0	9 3
1 ¾ in. do. for hot water, and joint to iron pipe ... 9/3	0	9 3
Remove the old sink **Q** with its connexions in housekeeper's room, and give credit and make good 5/-	0	5 0
Provide and fix a small enamelled fireclay sink fixed on proper fir-framed and wrought bearers 31/-	1	11 0
7 ft. run, 1½ in. lead waste, carried through external wall to discharge over gully 1/4	0	9 4
1 1½ in. lead syphon trap with cleansing cap and screw, and joint to pipe and trap 9/-	0	9 0
1 1½ in. lead anti-syphonage pipe carried through wall with copper wire fixed on end of pipe 7/6	0	7 6
1 1½ in. soldered joint 2/-	0	2 0
1 2½ in. brass grating, and soldering to sink 3/-	0	3 0
12 ft. run, ¾ in. lead supply to sink 1/1	0	13 0
1 ¾ in. branch joint 1/9	0	1 9
1 ¾ in. screw-down high-pressure horizontal bibcock (approved pattern) and joint to lead pipe 9/3	0	9 3
1 ¾ in. ditto, but joint to iron pipe 9/3	0	9 3

Work to Bath.

Disconnect supplies to bath **R** and clear away bath and lay aside lead safe for re-use 20/-	1	0 0
Remove hot-water cistern and its connexion and also small supply cistern and make good works disturbed ... 12/6	0	12 6

Provide and fix a first quality cast-iron enamelled bath 5 ft. 6 in. long 130/-	£6	10	0
Allow for repairing and re-fixing lead safe to bath ... 10/-	0	10	0
2 ft. run, 1½ in. lead overflow carried through external wall 1/4	0	2	8
1 1½ in. soldered joint 2/6	0	2	6
1 1½ in. copper flap, and soldering to end of pipe ... 1/6	0	1	6
16 ft. run, 1½ in. lead waste connected into sink waste 1/8	1	6	8
2 1½ in. soldered joints 2/10	0	5	8
1 1½ in. lead anti-syphonage pipe connected into ventilating pipe 7/6	0	7	6
2 1½ in. soldered joint 2/6	0	5	0
Provide and fix a copper waste with trap, and connect to bath 56/-	2	15	0
Allow for connecting up old hot and cold supplies ... 15/-	0	15	0
Provide and fix 1 in. plated overhanging screw-down taps to bath (approved pattern) and fixing complete ... 23/-	2	6	0
Alter cold service under bath tap that any leakage will fall into safe 5/-	0	5	0
Adapt and alter mahogany bath top and enclosures, and make part of front to shift readily for easy access to fitting 45/-	2	5	0
Disconnect present hot-water pipes from kitchen boiler, and make good 10/-	0	10	0
Provide and fix on strong iron bracket a 50 gallon strong galvanised iron circulating cylinder **FF** 150/-	7	10	0
30 ft. run, 1½ in. steam pipe flow, and return from boiler to cylinder &c. 2/3	3	7	6
2 drillings in boiler and all necessary connexion ... 6/-	0	12	0
2 connexions to cylinders 5/6	0	11	0
Provide and fix 1 in. gun-metal stopcock with square head and spanner fixed above trap of cold-water supply, and carry small branch of 1 in. pipe from cylinder and fix a similar bibcock, and draw off with nozzle an end for fixing hose if required 45/-	2	5	0
Connect up old 1 in. flow and return pipes to cylinder, with all necessary unions, back nut, &c. 10/-	0	10	0
Encase hot-water cyclinder with asbestos and leave inspection plate free 43/-	2	3	0
Drilling hole in boiler and providing and fixing a dead-weight safety valve on end of 1½ in. pipe, and brought through chimney breast 32/-	1	12	0
Work to Drains.			
Provide for the carrying off of rain water during the temporary removal of drains 20/-	1	0	0
469 ft. super. Take up stone paving, lay aside for re-use, and relay at completion, and make good any deficiency with new ... ... -/6	11	14	6
(NOTE.—This item will vary according to the conditions of the old floor.)			
132 ft. super. Take up wood flooring and joists, cut same as may be necessary for the removal of old drain, and relay at completion and make all good ... ... -/7	3	17	0
159 ft. run, dig, basket out, and cart away old drain, together with wet and contaminated earth, fill in all voids with lime and dry brick rubbish 1/9	13	18	3
Allow for removing any cesspools, catch-pits, &c., that may be found, and fill in with lime and dry brick rubbish as before 50/-	2	10	0
Seal off old connexion with main drain in cement ... 5/-	0	5	0
49 ft. run, 4 in. strong cast-iron drain pipe coated with Dr. Angus Smith's solution, the joints caulked with lead laid on 6 in. Portland cement concrete, including digging, average depth 3 ft., filling in and ramming remainder, basketed, and carted away 4/6	11	0	6
(NOTE.—This price will vary according to the nature of the ground and amount of strutting.)			
9 ft. run, 6 in. tested glazed stoneware pipes, the joints made with cement and sand, including laying on 6 in. Portland cement concrete and covering with 6 in. do. after drains are tested, including digging 2 ft. 6 in. deep, filling in and ramming, remainder basketed and carted away... ... ... 4/-	1	16	0
3 ft. run, 6 in. do. do., but digging 4 ft. deep and do.... 4/6	0	13	6
9 ft. run, 6 in. do. do., but deep digging, including any necessary planking and strutting from chambers to front vault 7/6	3	7	6
67 ft. run, 4 in. tested pipes, all as first described, digging average depth 2 ft. 6 in , and do. do. 3/9	12	11	3
2 extra only for 4 in. to 6 in. taper pipes... ... ... 1/3	0	2	6
6 extra to 4 in. bends 1/3	0	7	6
2 extra to 6 in. do. 1/9	0	3	6
3 cut holes through 4½ in. walls for 6 in. pipes, and form arched eyes 3/-	0	9	0
3 do., 9 in. do. 4/-	0	12	0
1 do., 14 in. do. 6/3	0	6	3
2 do., 22½ in. do. 8/9	0	17	6
Give notice to vestry and pay fees for connecting new drain to main sewer 100/-	5	0	0
Provide and fix a 12 in. fat trap flushing gully **BB**, with stone frame dished and rebated for iron cover ... 43/-	2	3	0
6 4 in. stoneware self-cleansing gullies, set on concrete, and connected to drain, gullies to have galvanised iron grids 8/9	2	12	6
Remove old brick dustbin, point and limewhite brickwork, and provide portable galvanised wrought iron dustbin 37/-	1	17	0
Inspection Chambers.			
Form two inspection chambers **W** and **Z**, as described, one in front area 3 ft. by 2 ft. 6in. by 4 ft. deep, inside measurement, one in middle area 3 ft. by 2 ft. by 2 ft. 6 in. deep; all as detail given below.			
6½ yds. cubic. Excavate, basket out, and cart away surplus earth 7/6	2	7	6
5½ yds. super, 6 in. Portland cement foundations ... 2/6	0	13	9
89 ft. super, one-brick wall in cement 1/3	5	11	3
21 ft. run, labour and material, corbelling over to receive air-tight covers 1/-	1	1	0
10 yds. super, render walls in Portland cement ... 3/-	1	10	0
Form sloping benches in cement and prepare concrete bottom to receive half channel pipes 10/-	£1	0	0
6 ft. run, 6 in. contracted outlet white glazed channel pipe, set in cement 2/6	0	15	0
7 4 in. white glazed channel curves 5/-	1	15	0
Provide and fix on proper cement concrete bed a syphon, with a 4 in. contracted inlet and 5 in. oulet, and connect on to outlet a 5 in. to 6 in. socket 25/-	1	5	0
Allow for bedding stopper of inspection eye in grease 1/6	0	1	6
6 ft. run, 4 in. galvanised iron pipe **DD** as air inlet, including chase in brickwork rendered in cement, and short length of 4 in. drain-pipe and easy bend connected to inspection chamber 3/6	1	1	0
1 4 in. galvanised mica inlet valve and fixing on end of pipe 12/-	0	12	0
4 eyes formed in the brick wall for 4 in. iron pipe to pass through 3/-	0	12	0
8 ditto 4 in. stoneware ditto 3/-	1	4	0
4 connexions of white glazed channels to 4 in. iron drain pipe 1/-	0	4	0
8 connexions of white glazed bends to 4 in. earthenware drain pipe 1/-	0	8	0
2 approved galvanised airtight covers and frames and fixing complete 65/-	6	10	0
Allow for cutting away and making good in all trades after all trades on the whole of the foregoing work not herein specified 200/-	10	0	0
	£390	0	2
Credit value of old materials	12	10	0
	£377	10	2

THE SUBURBAN VILLA.

REPORT AND SUGGESTIONS ON EXAMPLE III.

In this case the report is condensed, and it is assumed that the house is in an insanitary condition, which would probably be the case unless, indeed, it had been dealt with under recent regulations.

The roof is of red tiles with two steep gables that face the side road (it is a corner house). The roof over the back addition is a hipped lean-to.

119. ***Rain-water Pipe No. 1.***—Provide a 2 in. galvanised iron rain-water pipe to carry off water from the gutter round the bay-window in front, with a double set-off and shoe, to deliver into gully **E**.

120. ***Rain-water Pipe No. 2.***—Provide and fix between the main gables a 3½ in. galvanised iron rain-water pipe fitted with head and swan neck bend from the same, also a set-off for plinth projection and shoe, to carry off the water from the valley gutter into gully **D**.

121. ***Rain-water Pipe No. 3.***—This takes the water from two sides of the hip roof and is to be a similar pipe to the last; but in place of the shoe at the foot it is carried into a 4 in. drain pipe under the paving, and is connected into a side inlet of the gully **C** in the centre of the paved yard.

Note A A A.—This is done in order to avoid the length of unventilated drain which would otherwise be required.

122. ***Rain-water Pipe No. 4.***—This takes the water from the half of the second gable which falls into the back gutter of the hip roof, the water from this back gutter and from the roof of the small bay window. Carry down a similar pipe as last, with a small 2 in. branch from the gutter of the bay, to deliver over gully **A**.

123. ***Cisterns.***—There is a 150 gallon galvanised iron cistern in a small boxroom, formed in the roof over the bathroom. This supplies the house. The overflow is carried through the roof. Provide a wooden lid to this cistern. There is already enough light and ventilation. As there is a constant water-supply the present services will not require alteration. Through the recommendations of the Commissioners on River Pollution many of the suburban water companies supply the several house fittings direct from the main, without the intermediate storage tank, and most allow one tap direct from the main. The recommendation runs as follows: "All storage of drinking water in the house is attended with the risk of pollution. Good water is spoiled and bad water is rendered worse by the intermittent system of supply. All drinking water ought to be drawn direct from the main."

124. ***W.C. on First Floor.***—Remove the present defective valve closet together with the cast-lead trap and short length of lead soil-pipe. At present this short length of pipe is connected into a common 4 in. cast-iron rain-water pipe, the joint is made with red lead in the thickness of the wall thus (see Fig. 32) and is very defective. Lay lead safe with front edge turned over the fillet and carry 1½ in. overflow through the external wall. Provide and fix a combination lead pedestal closet with slop top, one that enables the connexion to the soil-pipe to be made by means of a plumber's soldered joint.

Note B B B.—The objection before stated as to the ordinary cast lead

traps, on account of their internal roughness and liability to sand holes, is much less in the case of these closets, as they are mostly cast under pressure. The trap also is in sight above the floor line, so that any leakage could at once be seen. They must be tested by water. (See par. 24.)

125. *Recommendation.*—Carry a short length of 10 lb. 3½ in. lead soil-pipe from the top closet, the end to be fitted with a brass sleeve piece, and form a caulked lead joint into long branch of new iron soil-pipe, or a still better plan is to use the short arm, but turn it so that the connexion with the lead pipe is outside the house. This iron pipe in order to meet the requirements of the London County Council must weigh 56 lb. to the 6 ft. length, and should be at least ¼ in. in thickness. (See Fig. 33.)

FIG. 32.

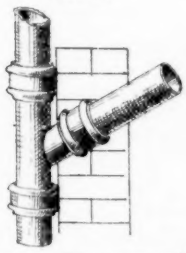
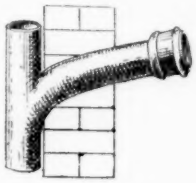
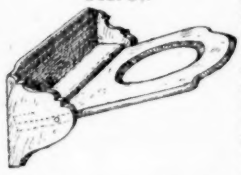


FIG. 33.



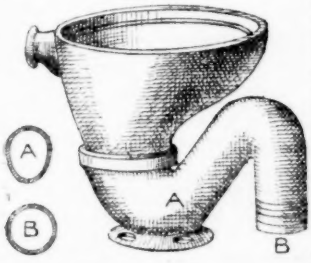
Connect a 2 in. strong lead anti-syphonage pipe on to the out-go of the trap and carry it through the outer wall. (See par. 131 and Note o in first example.)

FIG. 34.



Provide and fix on suitable cast-iron brackets a 3 gallon silent water-waste preventer. Lay on the water to the same from the old service to the closet by a ½ in. lead service and connect a 1¼ in. down service from the cistern through the external wall. Supply and fix a hinged mahogany seat as supplied with closet. (Fig. 34.) The seat shown is self-raising, worked by means of a loaded end. (See dotted lines.)

FIG. 35.



126. *W.C. in Yard.* Remove the present side wash-out closet and fix in place of the same a short hopper basin with flushing rim and stoneware glazed S trap under. Build a brick pedestal to carry the basin and cement the same; also the floor where not already done under seat and the brick-work round the back and sides of the closet. Provide and fix a stout deal hung seat, with brackets to carry the same, and paint this and new-cement underneath.

Note c c c.—This (Fig. 35) is an excellent one, both on account of the shape of the pan and also for the readiness with which it is flushed, owing to the contraction in the bottom of the trap.

FIG. 36.

P trap.

127. *Lavatory Basin* **L**.—This is a white glazed basin with brass plug-waste. Supply and fix a 1¼ in. drawn lead syphon-trap (Fig. 36) under the same, fitted with brass cleansing screw and connect into the bath-waste. Carry a short 1¼ in. anti-syphonage pipe just through the external wall with + copper guard on the end of the pipe. (See par. 42, first example.)

128. *Bath.*—This bath, though a cheap one, is very good from a sanitary point of view, being far better than if enclosed with a wooden case. It is a cast-iron parallel bath with a rolled edge, it stands upon feet independently, and is supplied by two bibcocks at the foot. It is fitted with plug and chain waste. Disconnect this 1¼ in. waste from the old rain-water pipe, lengthen and continue down to the gully **B** by the scullery window. Disconnect the bath and provide and fix in waste under same a drawn 1¼ in. running stout lead trap with brass cleansing screw. (Fig. 37.) Carry up this 1¼ in. waste as anti-syphonage pipe through the projecting eaves of the roof to stand up about 12 in. above the same and make good to slate with lead collar with a 1 in. branch from outgo of trap into same. Refix the bath and make good all connexions, including overflow.

FIG. 37.

Running trap.

129. *Hot Water System.*—There is a 40 gallon hot-water tank in the cupboard in this bathroom with an expansion pipe turned over the cistern in the box-room. It is heated from the kitchen boiler. There should be a ¾ in. dead weight safety-valve fixed on a short length of steam pipe carried from the top of the kitchen boiler.

FIG. 38.

S trap.

130. *Scullery Sink.*—This is a stone sink. After the removal of old waste, &c., provide and fix a brass grate and union. Carry a 2½ in. strong lead waste from the same to deliver into the external gully **B**. Provide and fix under the sink a strong drawn lead S-trap, fitted with brass cleansing screw (Fig. 38), with a 1½ in. anti-syphonage pipe through the external wall.

Provide a short ½ in. branch stout lead pipe from rising main fitted with a high-pressure screw-down bibcock to supply sink.

131. *Soil Pipe* **H**.—This pipe from the first-floor closet is a common light cast-iron rain-water pipe. It is continued up to the eaves and gutter in zinc to act as a rain-water pipe and ventilator. This must be removed entirely. A moderately stout 3½ in. galvanised cast-iron special soil-pipe, weighing 56 lb. to the 6 ft. length, fitted with ears for fixing, and large collars for caulked joints, must be carried up in place of the old pipe. The joints must be all caulked in the usual way and run with lead, and the connexions with the soil-pipe of the first-floor w.c. and the anti-syphonage pipe from the same made by means of proper iron junctions and brass thimble (see Fig. 1), or the anit-syphonage pipe may be screwed into the iron pipe with a brass union and back-nut. This last pipe is to enter the soil-pipe about 2 ft. above the joint of the closet branch. The upper end of the soil-pipe is to be carried through the eaves of the back addition and either run up to 12 in. above the ridge or to stand up about 5 ft. above the gutter, fixed with proper iron stays and copper wire guard on top, the hole in the eaves to be made good with lead collar.

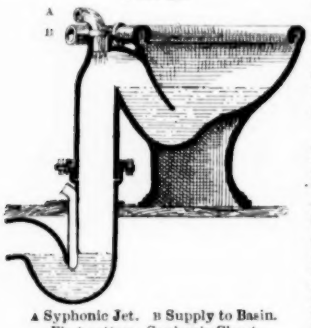
132. *Ventilating Pipes.—Outlet-Pipe.*—Carry up at the end of the drain, in the corner formed by the bay window of the kitchen, a 4 in. cast-iron pipe, like that used for the soil-pipe, continued through the projecting eaves to finish about 4 ft. through the roof. Make good with lead collar and fit a copper wire guard on top of the pipe.

133. *Inlet-Pipe.*—Unless this side where the inlet is shown had been much cooler than the side where the outlet is fixed in the garden, this pipe should have been carried up in the corner by the chimney stack to within 4 ft. of the top, not higher, that the drain air may not be drawn into the flues, in all other respects as the last pipe. This, however, being the cold side, it will be sufficient to carry it up about 2 ft. only above the ground, fitted on the top with an inlet grating. (See Note z ii, Example II.)

134. *Drains.*—After the removal of the old drains and wet earth (see provisional amount) dig out ground for disconnecting chamber **J**. Form on a 6 in. concrete bottom and build in 9 in. brickwork in cement a chamber 3 ft. long by 2 ft. 3 in. wide. Fix on the concrete at the outlet a syphon trap, as shown in illustration. (Note z ii in first example.) Fix in the bottom of the manhole with a fall of 6 in. in the 3 ft. a 5 in. taper channel-pipe with egg-shaped outlet. Lay channel-bend to receive the drain from the gully and form banks at the side of the chamber, as shown in section. Lay down on a proper concrete bed, level with top of, and connected into, chamber, a 6 in. glazed drain-pipe to connect with the fresh air inlet-pipe. Gather over brickwork at top of the chamber to receive a stout cast-iron galvanised manhole cover and supply and fix same. Build a manhole or inspection chamber **G** at the corner in the garden in the same way as described for inspection chamber, but with the omission of the syphon trap and the inlet ventilator, the channel pipe to be the same size at each end. Dig out ground to form a trench from the top end of the drain to the

boundary of the premises, with a fall throughout to sewer of half an inch to each pipe, the 6 in. fall in the chamber not included, the trench to be of sufficient width at the bottom to allow a man to walk with one foot on each side of the pipes without treading on them when laid, and to have the sides to slope at an angle of not less than 80°. Lay a 6 in. bed of concrete, and on the same lay, as shown on plan, a 6 in. glazed stoneware London-made drain, with 4 in. branches from gullys, w.c.'s, &c., each pipe to be laid carefully with a proper cement joint, each joint to be wiped out inside so as not to leave any rough internal edges. Fill in with concrete all round the pipes after the drains have been tested with water and passed. Gullies **A, D,** and **E** are to be fitted with half channel side inlets and galvanised wire covers. Gully **B** to have an egg-shaped bottom with back inlet for scullery sink waste and a side inlet for waste of bath. At completion the trenches are to be carefully filled in and levelled, and all cutting away, &c., made good. Make good the cement paving in enclosed yard with a proper fall each way into the new gully. Test again with water, and after the manhole covers have been bedded down with grease test by some well-known chemical means.

FIG. 39.



▲ Syphonic Jet. B Supply to Basin.
First pattern, Syphonic Closet.

Note D D D.—No reference has yet been made to the latest departure in the manufacture of closets. The syphonic principle is an alluring one to the plumber. It offers a closet that will give as large a body of water as that contained in the basin of a valve closet, a deeper water seal in the trap, and at the same time dispenses with the somewhat complicated mechanism that forms the valve closet's chief drawback. The form of the first closet of this pattern invented is shown in Fig. 39.

ESTIMATE

For proposed Alterations and Sanitary Work as explained in Specification and shown on Plan. (EXAMPLE III.)

		£	s.	d.
Work to Rain-water Pipes.				
Remove the whole of rain-water pipes, and make good	25/-	1	5	0
13 ft. run, 2 in. galvanised iron rain-water pipe to front bay	-/10	0	10	10
1 2 in. plinth bend	1/8	0	1	8
1 2 in. shoe	1/-	0	1	0
28 ft. run, 3½ in. galvanised iron rain-water pipe to valley gutter	1/4	1	17	4
1 3½ in. swan neck	4/3	0	4	3
1 3½ in. head	3/6	0	3	6
1 3½ in. plinth bend	2/6	0	2	6
1 3½ in. shoe	1/10	0	1	10
28 ft. run, 3½ in. galvanised iron rain-water pipe to two sides of hip roof	1/4	1	17	4
1 3½ in. swan neck	4/3	0	4	3
1 3½ in. head	3/6	0	3	6
1 3½ in. plinth bend	2/6	0	2	6
24 ft. run, 3½ in. galvanised iron rain-water pipe at back	1/4	1	12	0
1 3½ in. swan neck	4/3	0	4	3
2 3½ in. heads	3/6	0	3	6
1 3½ in. shoe	1/10	0	1	10
2 ft. 6 in. run, 2 in. galvanised iron rain-water pipe to back bay	-/10	0	2	1
Cistern.				
1 ½ in. matched boarded ledged cover to 150 gallon cistern	10/-	0	10	0
Work to Water-closets.				
Remove present valve closet first floor and its connexions and make good	10 -	0	10	0
Milled lead to safe	12 -	0	12	0
3 ft. run, 1 in. by 1½ in. deal fillet, and labour dressing lead	-/6	0	1	6
2 ft. run, 1½ in. lead overflow	1/8	0	3	4
1 1½ in. joint	2/10	0	2	10
Provide and fix a combination lead pedestal closet with french polished hinged mohogany seat	90/-	4	10	0
1 short branch of 3½ in. 10 lb. lead bent pipe, about 3 ft. 6 in. long, and joint to trap	30/-	1	10	0
1 3½ in. brass thimble and joint to iron pipe	11/-	0	11	0
4 ft. run, 2 in. lead anti-syphonage pipe	2/6	0	10	0
1 2 in. joint	3/4	0	3	4
1 3 gallon silent water-waste preventer, and fixing on cast-iron brackets	32/-	1	12	0
2 ft. 6 in. run, ½ in. lead supply	-/9	0	1	10
2 ½ in. joints	1/7	0	3	2
2 ft. run, ½ in. lead overflow pipe from water-waste preventer	1/9	0	3	6
1 ½ in. joint	1/1	0	1	1
6 ft. run, 1½ in. lead flush pipe	1/4	0	8	0
2 1½ in. joints	2/6	0	5	0
1 ft. 6 in. run, 1 in. lead overflow	1/2	0	1	9
1 1 in. joint	2/-	0	2	0
Remove present wash-out closet in yard, and make good	5/-	0	5	0
Provide and fix a short hopper basin, with flushing rim and stoneware glazed P trap carried on brick pedestal, and connect to drain	30/-	1	10	0
3 yards super. Portland cement rendering	3/-	0	9	0
1 deal hinged seat fixed with brackets	2/6/-	1	6	0
Re-connecting and altering supplies	20/-	1	0	0
Lavatory.				
Disconnect waste to lavatory and fix 1¼ in. lead syphon trap, with cap and screw	5/-	0	5	0
3 1¼ in. joints	2/6	0	7	6
1 1¼ in. anti-syphonage pipe, about 2 ft.	3/6	0	3	6
1 1¼ in. joint	2/6	0	2	6
1 copper guard to 1¼ in. pipe and soldering	1/-	0	1	0
Bath.				
Disconnect bath waste from old rain-water pipe and also waste to bath	7/6	0	7	6
11 ft. run, 1¼ in. lead waste to bath	1/4	0	14	8
1 1¼ in. lead syphon trap, with cap and screw	3/-	0	3	0
2 1¼ in. joints	2/6	0	5	0
18 ft. run, 1¼ in. lead anti-syphonage pipe carried up through eaves	1/4	1	4	0
1 1¼ in. joint	2/6	0	2	6
Make good to slate roof with lead collar and soldering to pipe	10/-	0	10	0
Refix bath and make good all connexions	20/-	1	0	0
Drill hole in top of kitchen boiler and fix short length of 1 in. pipe, with dead-weight safety valve	22/-	1	2	0
Sink.				
Remove old waste to scullery sink	3/6	0	3	6
3 ft. run, 1¼ in. lead waste	1/4	0	4	0
1 1¼ in. lead syphon trap, with cap and screw	5/-	0	5	0
2 1¼ in. joints	2/10	0	5	8
1¼ in. lead anti-syphonage pipe about 1 ft. 6 in.	3/6	0	3	6
1 1¼ in. joint	2/6	0	2	6
1 copper guard to 1¼ in. pipe and soldering	1/-	0	1	0
12 ft. stout ½ in. lead service	-/9	0	9	0
1 ½ in screw-down high-pressure bibcock	4/10	0	4	10
2 ½ in. soldered joints	1/7	0	3	2
Soil-pipe.				
Remove present soil-pipe and make good	12/6	0	12	6
28 ft. run, 3½ in. galvanised iron soil-pipe, with ears for fixing, and large collar, the joints to be caulked with lead	2/6	3	10	0
1 3½ in. copper wire balloon	3/-	0	3	0
1 set of iron stays for securing pipe	10/-	0	10	0
1 hole through eaves, lead, slate, and soldering	10/-	0	10	0
1 3½ in. junction to galvanised iron pipe	5/-	0	5	0
1 2½ in. do. do.	2/6	0	2	6
1 3½ in. brass collar with easy bend, and connect to drain	12/6	0	12	6
23 ft. run, 4 in. cast-iron ventilating pipe to drain, joints caulked with tow and red lead	1/2	1	6	10
1 4 in. copper wire balloon	3/-	0	3	0
1 set of iron stays for securing pipe	10/-	0	10	0
1 hole through eaves, with lead, slate, and soldering	10/-	0	10	0
1 4 in. brass collar with easy bend, and connect to drain	12/6	0	12	6
Work to Drains.				
Remove old drain and make good	250/-	12	10	0
31 ft. run, 4 in. stoneware tested drain-pipe, joints make with cement and sand laid on 6 in. Portland cement concrete, and cover all round with ditto, including digging, average depth 1 ft., filling in, and ramming	3/-	4	13	0
21 ft. run, 4 in. ditto, ditto, and ditto, but digging average depth 2 ft., and ditto	3/6	3	13	6
29 ft. run, 6 in. stoneware tested drain pipe, all as last described and digging average depth of 1 ft.	3/6	5	1	6
57 ft. run, 6 in. ditto, ditto, but digging 2 ft., and ditto	4/0	11	8	0
7 extra to 4 in. bends	1/3	0	8	9
4 extra to 6 in. by 4 in. junction	1/9	0	7	0
3 extra to taper pipes	1/3	0	3	9
9 ft. run, 6 in. stoneware tested drain pipe, but deep digging, including any necessary planking and strutting	5/9	2	11	9
1 connexion with main sewer and pay all necessary fees	100/-	5	0	0
4 gullies and grids, set in concrete and connected to drain	8/9	1	15	0
1 gully with egg-shaped bottom, with back inlet for scullery sink	15/-	0	15	0
7 yards super., make good cement paving	2/6	0	17	6
Inspection Chambers.				
Form inspection chambers, one 3 ft. by 2 ft. 3 in by 1 ft. deep, and one 3 ft. by 2 ft. 3 in. by 2 ft. 6 in. deep, as follows:—				
4 yards cube, dig and cart away surplus earth	7/6	1	10	0
1 yard cube, Portland cement concrete foundation	15/-	0	15	0
47 ft. super., 1 brick in cement	1/3	2	18	9
5½ yards super., Portland cement rendering	3/-	0	16	6
5 ft. run, 6 in. white glazed channels	2/3	0	11	3
1 6 in. white glazed channel bend	6/-	0	6	0
2 4 in. ditto ditto	5/-	0	10	0
4 holes through inspection chamber for 6 in. pipe and make good	1/6	0	6	0
3 ditto for 4 in. pipe	1/6	0	4	6
2 form sloping benches and prepare bottom of chamber to receive channel pipes	10/-	1	0	0
1 6 in. syphon trap set in concrete and connect with drain	15/-	0	15	0
Seal off old connexion to drain	10/-	0	10	0
Short piece of 4 in. galvanised iron pipe for fresh-air inlet	7/-	0	7	0
1 4 in. fresh-air inlet and fixing	12/-	0	12	0
2 approved cast-iron galvanised manhole covers and fixing	65/-	6	10	0
21 ft. run, corbelling brickwork to receive inspection cover	1/-	1	1	0
Allow for cutting away for and making good in all trades after all trades on the foregoing work	70/-	3	10	0
		£114	17	5

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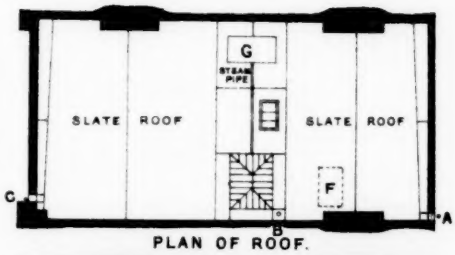
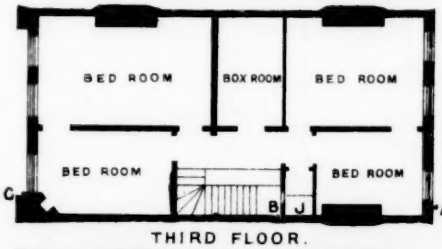
EXAMPLE I.

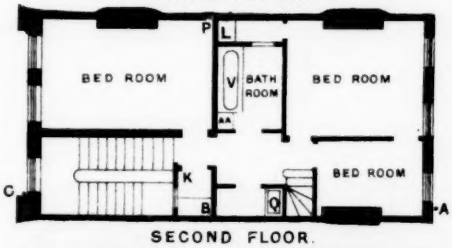
A Rain-water pipe, Par. 2.
B ,, ,, Par. 4; also soil-pipe from **J**.
C Rain-water pipe, Par. 6; also soil-pipe from **M**.
D Rain-water pipe, Par. 8.
E ,, ,, Pars. 9 and 59.
F Lead-lined cistern in roof, Par. 11.
G Slate cistern on lead flat, Par. 13.
H Lead-lined cistern in cupboard, par 17.
I Cast-lead cistern in area, Par. 19.
J Pan closet, Par. 22.
K Old valve closet, Par. 25.
L Bramah closet, Par. 27.
M Side wash-out closet, Par. 29.
N Hopper closet, Par. 31.
O ,, ,, Par. 33.
P Soil-pipe, Par. 35.
Q Housemaid's sink under stairs, Par. 38.
R Sink (scullery), Par. 41.
S ,, (servants' hall), Par. 43.
T ,, pantry, Par. 45.
U ,, (housekeeper's room), Par. 47.
V Bath, Par. 49; also Par. 35.
W Bell-traps under boiler taps, Pars. 56 and 63.
X Iron D-trap, Par. 59.
Y Iron bell-trap, Par. 65.
Z Brick-built dip-trap, Par. 66.
AA Hot-water cistern, Par. 52.



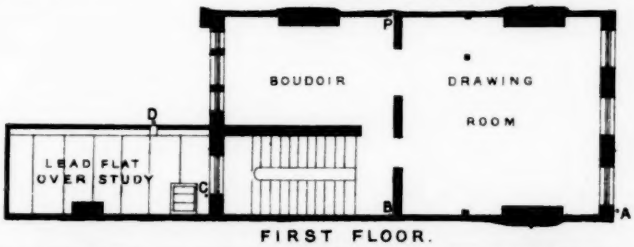
PLAN OF ROOF.



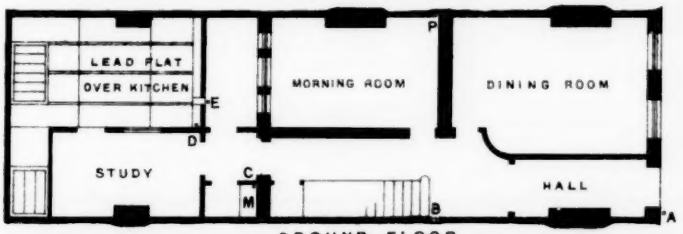
THIRD FLOOR.



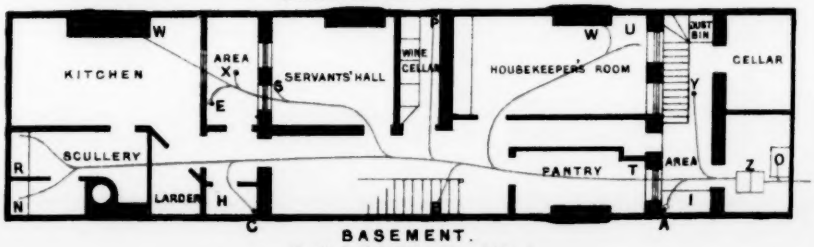
SECOND FLOOR.



FIRST FLOOR.



GROUND FLOOR.

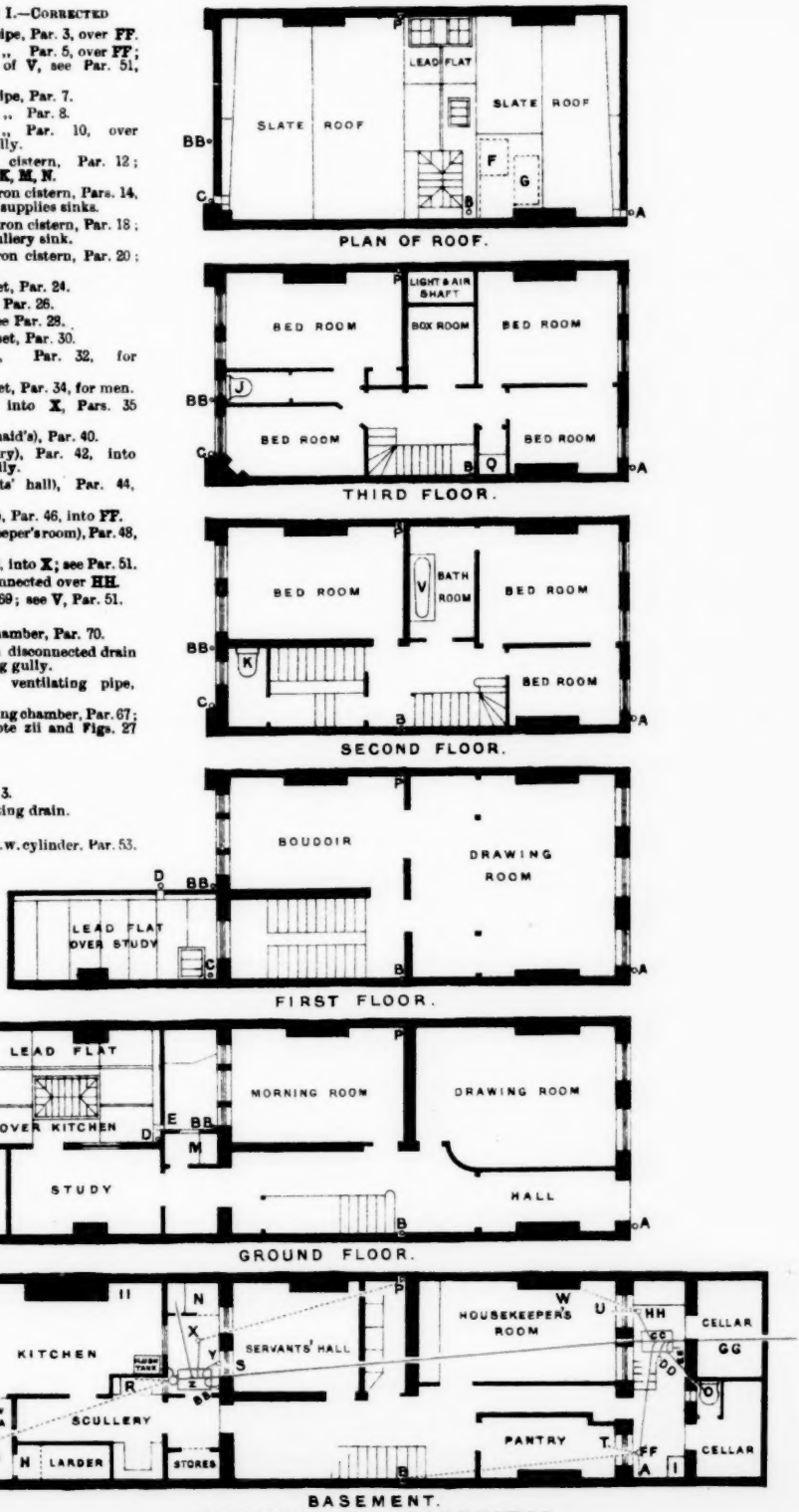


BASEMENT.

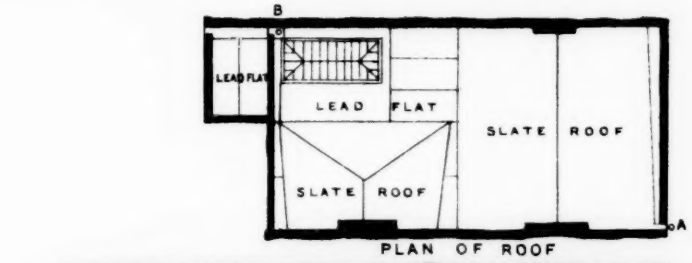
EXAMPLE Nº I.

EXAMPLE I.—CORRECTED

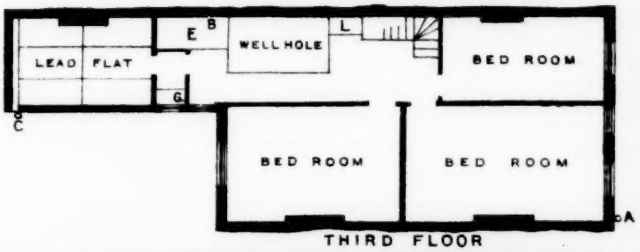
A Rain-water pipe, Par. 3, over **FF**.
B ,, ,, Par. 5, over **FF**; also waste of **V**, see Par. 51, into **X**.
C Rain-water pipe, Par. 7.
D ,, ,, Par. 8.
E ,, ,, Par. 10, over flushing gully.
F Lead-lined cistern, Par. 12; supplies **J, K, M, N**.
G Galvanised iron cistern, Pars. 14, 15, and 16; supplies sinks.
H Galvanised iron cistern, Par. 18; supplies scullery sink.
I Galvanised iron cistern, Par. 20; supplies **O**.
J Pedestal closet, Par. 24.
K Valve closet, Par. 26.
L Removed; see Par. 28.
M Pedestal closet, Par. 30.
N ,, ,, Par. 32, for women.
O Pedestal closet, Par. 34, for men.
P Bath waste into **X**, Pars. 35 and 51.
Q Sink (housemaid's), Par. 40.
R Sink (scullery), Par. 42, into flushing gully.
S Sink (servants' hall), Par. 44, into **Y**.
T Sink (pantry), Par. 46, into **FF**.
U Sink (housekeeper's room), Par. 48, into **HH**.
V Bath, Par. 49, into **X**; see Par. 51.
W Gully, disconnected over **HH**.
X ,, Par. 69; see **V**, Par. 51.
Y ,,
Z Inspection chamber, Par. 70.
AA Gully, with disconnected drain into flushing gully.
BB Soil and ventilating pipe, Par. 36.
CC Disconnecting chamber, Par. 67; also see Note zii and Figs. 27 and 28.
DD Gully.
EE Air inlet.
FF Gully, Par. 3.
GG Eye for testing drain.
HH Gully.
II Position of H.W. cylinder, Par. 53.



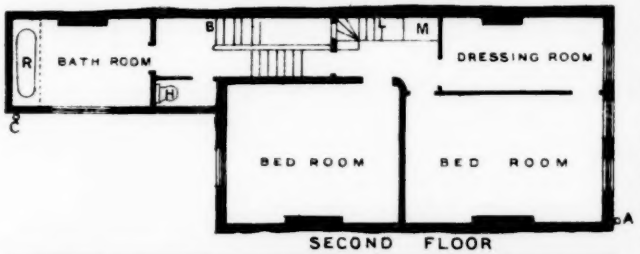
EXAMPLE No. I. CORRECTED.



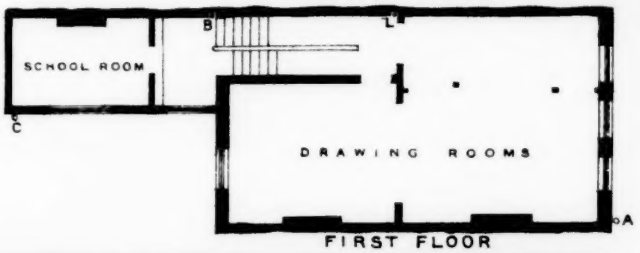
PLAN OF ROOF



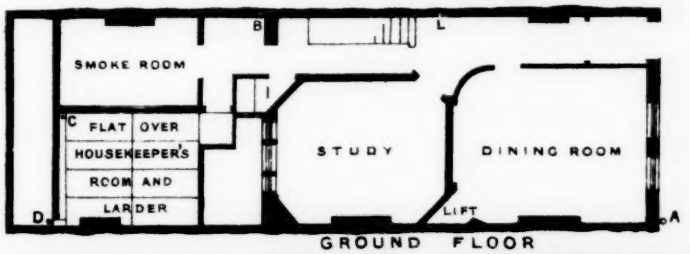
THIRD FLOOR



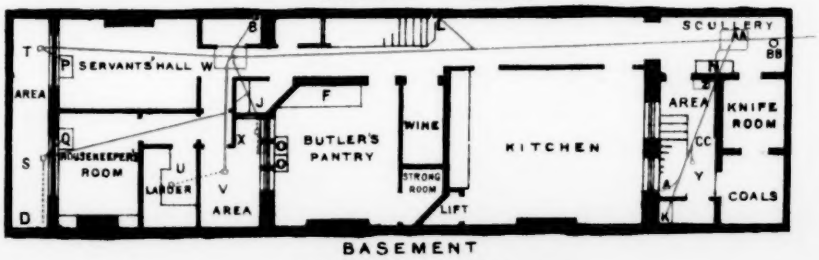
SECOND FLOOR



FIRST FLOOR



GROUND FLOOR

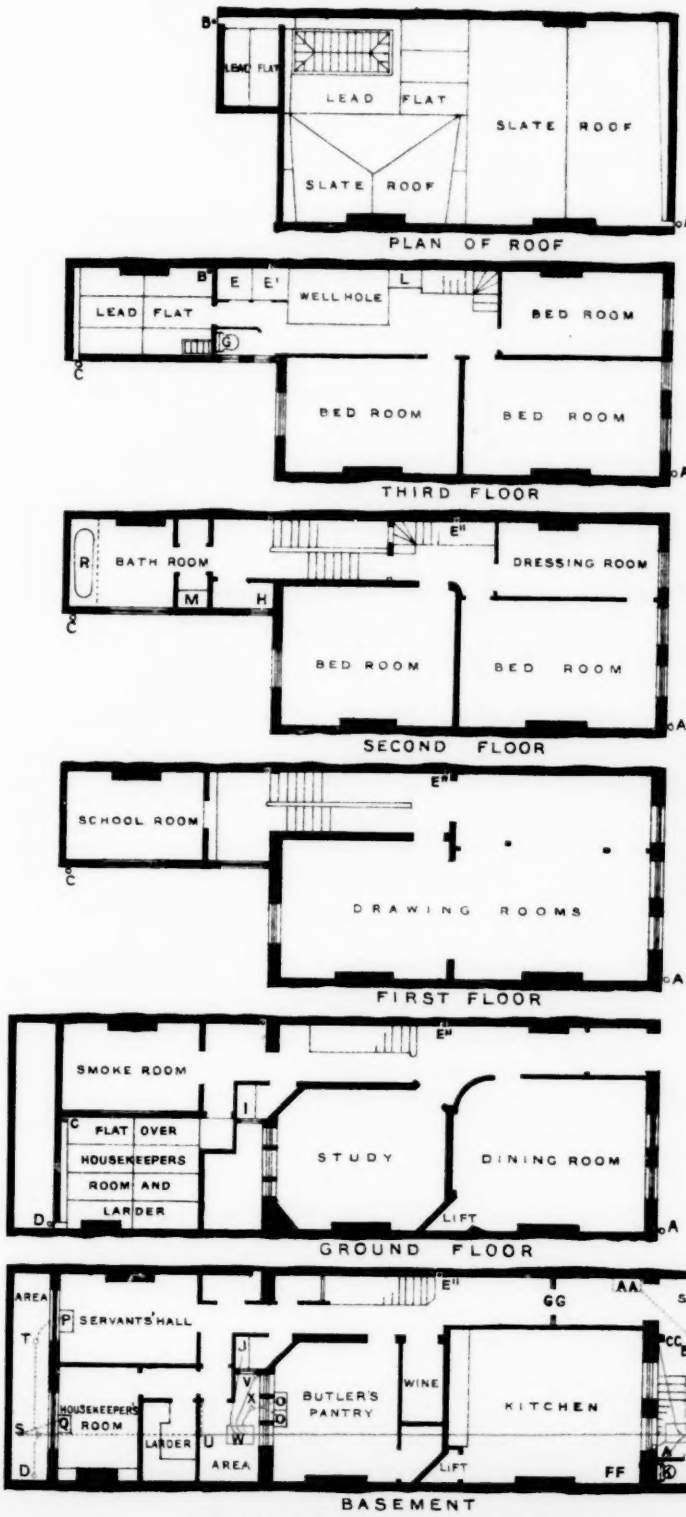


BASEMENT

EXAMPLE Nº 2

EXAMPLE II.

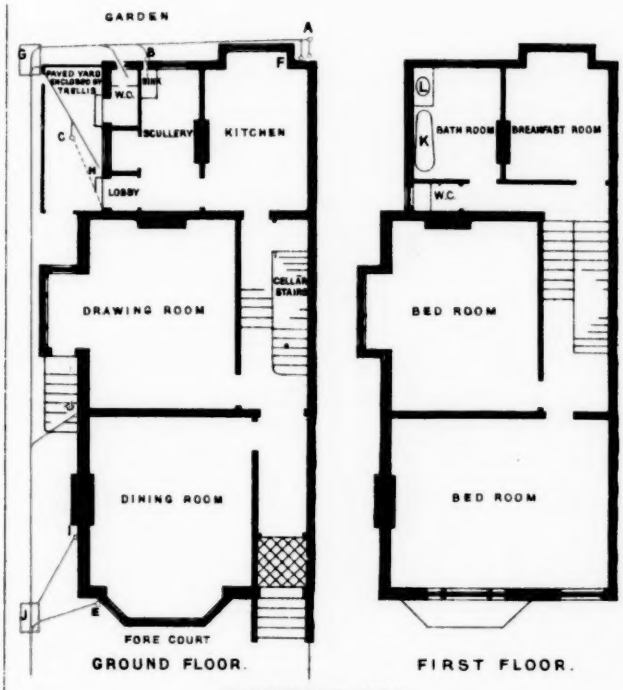
A Rain-water pipe, Par. 74.
B ,, ,, Par. 75.
C ,, ,, Par. 77.
D ,, ,, Par. 79.
E Cistern, Par. 81.
F ,, Par. 84.
G w.c., Par. 87.
H ,, Par. 89.
I ,, Par. 91.
J ,, Par. 93.
K ,, Par. 96.
L Sink, and waste from same, Par. 99
M ,, Par. 101.
N ,, Par. 104.
O ,, Pars. 107, 109, and Note 11.
P ,, Par. 110.
Q ,, Par. 112.
R Bath, Par. 114.
S Gully, Par. 118.
T ,, Par. 118.
U ,, Par. 118.
V ,, Par. 118.
W Inspection chamber, Par. 117.
X Gully, Par. 107.
Y ,, Par. 117.
Z Fat-trap, Par. 117.
AA Disconnecting chamber, Par. 116.
BB Eye for testing drain.
CC Fresh air inlet, Par. 117.



EXAMPLE II.—CORRECTED.

A Rain-water pipe, Par. 74.
B ,, ,, Par. 76.
C ,, ,, Par. 78.
D ,, ,, Par. 80.
E Lead-lined cistern, Par. 82.
E¹ Galvanised iron cistern, Pars. 82 and 83.
E¹¹ Down service from cistern **E¹**; all rising mains in same casing.
F See Par. 85.
G W.C., Par. 88.
H ,, Par. 90.
I ,, Par. 92.
J ,, Par. 94.
K ,, Pars. 96 and 98.
L Sink removed, Par. 100.
M ,, (housemaid's), Pars. 102 and 103, into **U**.
N Sink (scullery), Par. 105, into **BB**.
O ,, (pantry), Par. 108, into **X**.
P ,, (servants' hall), Par. 111, into **T**.
Q Sink (housekeeper's), Par. 113, into **S**.
R Bath, Par. 115, into **U**.
S Gully, Par. 118.
T ,, Par. 118.
U ,, Pars. 101 and 118.
V Soil- and ventilating-pipe, Par. 98.
W Inspection chamber, Par. 118.
X Gully, Par. 108.
Y
Z Disconnecting chamber, Par. 118.
AA Flushing tank, Par. 106.
BB Flushing gully, Par. 105.
CC Gully.
DD Fresh air inlet
EE Bye for testing drain.
FF Hot-water cylinder, Par. 115.
GG Swing door, Par. 106.

EXAMPLE Nº 2 CORRECTED



EXAMPLE Nº 3.

THE SUBURBAN VILLA.

SUBURBAN VILLA.

A Par. 134, Gully taking rain-water pipe No. 4 (Par. 122).
B Par. 134, Gully taking scullery sink (Par. 130) and Bath (Par. 128).
C Par. 134, Gully taking rain-water pipe No. 3 (Par. 121).
D Par. 134, Gully taking rain-water pipe No. 2 (Par. 120).
E Par. 134, Gully taking rain-water pipe No. 1 (Par. 119).
F Par. 132, Ventilating-pipe to drain.
G Par. 134, Inspection chamber.
H Par. 131, Soil-pipe.
I Par. 133, Inlet ventilator.
J Par. 144, Disconnecting chamber
K Par. 128, Bath.
L Par. 127, Lavatory.